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ABSTRACT

This document was originally designed for the Pennsylvania Council of Supervisors of Mathematics (PCSM) to meet a need in the available literature on supervision in mathematics education. Chapters include an introductory section that details the specific needs, skills, and duties of the mathematics administrator, and sections titled: (1) Types of Mathematics Supervisors and Their Specific Duties; (2) Certification Requirements for a Mathematics Supervisor in Pennsylvania; (3) The Mathematics Supervisor and Evaluation; and (4) The Supervisor and Inservice Education. The four appendices are: (1) Responses to PCSM 1980 Mathematics Supervisors Survey; (2) PDE Curriculum Requirements K-12; (3) Certification Policies, Procedures, and Standards; and (4) The Pennsylvania Comprehensive Mathematics Plan Direction for the 80's (PCMP). It is hoped that this handbook might have some use in other states, and its application in Pennsylvania is expected to lead to some degree of standardization of the role of the mathematics supervisor there. (MP)

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PCSM

HANDBOOK for Mathematics Supervisors in Pennsylvania

PREPARED BY

PENNSYLVANIA COUNCIL OF SUPERVISORS OF MATHEMATICS

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PENNSYLVANIA COUNCIL OF SUPERVISORS OF MATHEMATICS

HANDBOOK FOR MATHEMATICS SUPERVISORS

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SUPERVISION IN MATHEMATICS

Pennsylvania's Council of Supervisors of Mathematics Position Statement

From its inception the Pennsylvania Council of Supervisors of Mathematics (PCSM) has sought through surveys and discussions to determine the status of mathematics supervision in Pennsylvania. The findings are enlightening, though in some respects encouraging and in others alarming. Supervision in mathematics takes many forms from that of full time K-12 Supervisor in some school districts to no apparent supervision in others with a range of intermediate titles including department chairman and coordinator. PCSM has as it's goal the promotion of excellence in mathematics education in every school district in Pennsylvania. The council believes that this goal cannot be achieved without standards for supervision in mathematics. Accordingly, the following standards have been adopted by the PCSM.

1. Every school district in Pennsylvania should have a mathematics supervisor whose scope of responsibility is K-12.
2. The mathematics supervisor should be an individual who has demonstrated a high level of scholarship in mathematics and a high level of competency in teaching.
3. The mathematics supervisor should maintain an active roll in instruction through a part time teaching assignment, demonstration teaching or other special assignments which involve direct contact with pupils.
4. The mathematics supervisor should have adequate time to perform supervisory duties.
5. The mathematics supervisor should interview prospective mathematics teachers and should have an influential voice in the selection of new teachers.
6. The mathematics supervisor should be responsible for the coordination of the mathematics curriculum from K-12 and should determine what materials, supplies and personnel are required for successful implementation.

7. The mathematics supervisor should be employed on a twelve month basis to provide sufficient opportunity for curriculum development and professional growth.
8. The mathematics supervisor should be an active member of local, Pennsylvania and National Council of Teachers of Mathematics as well as PCSM and NCSM.
9. The mathematics supervisor should be released by the school district to attend State and National mathematics meetings and should be reimbursed for expenses.
10. The mathematics supervisor should communicate with all teachers in the district who teach mathematics and should be responsive to the ideas and suggestions of staff members.
11. The mathematic supervisor should work with other subject area supervisors in coordinating resourses and program activities.
12. The mathematics supervisor should be the spokesperson for the mathematics program and should strive to educate the professional staff and the community to the importance of mathematics and its vital role in society.

The PCSM recognizes the importance of the position of mathematics supervisor and also realizes that many persons appointed to this position receive a copy of a job description and little else in the way of orientation. The council authorized the production of this handbook so that the composite wisdom of experienced supervisors from all sections of Pennsylvania could be used to analyze and define the role of the mathematics supervisor. It is the goal of this hanbook to outline the scope of the supervisor's duties, suggest guidlines for performance, and provide sources of help for supervisors. The PCSM hopes that the dissemination of this handbook will ultimately result in some degree of standardization in the role of mathematics supervisor among the school districts in Pennsylvania.

This handbook has been three years in the making. The following people have been instrumental in the development and editing of the material.

Chapter II - Types of Mathematics Supervisors and Their Specific Duties
Ralph Hunsberger - Central Bucks High School (East)
Melva Voegler - Wallenpaupack Area High School
Mary Moran - Pleasant Valley High School
Don Scheuer - School District of Philadelphia

Chapter III - Certification Requirements For A Mathematics Supervisor in Pennsylvania
Dennis Risher - Kiski Area School District

Chapter IV - The Mathematics Supervisor and Evaluation
Robert Murphey - School District of Philadelphia
Rachel Spade - Cumberland Valley School District
Richard Hammann - Carlisle School District

Chapter V - The Supervisor and In-Service Education
Al Mauthe - Norristown Area School District
Bruce Burt - West Chester Area School District
Lois Barson - School District of Philadelphia

Advisory Committee

Doris Creswell - Mathematics Education Advisor, Pennsylvania Department of Education
Alex Tobin - School District of Philadelphia
Peter Lanza - Quaker Valley School District
Alan Barson - School District of Philadelphia
Dave Williams - School District of Philadelphia

It is our hope that this handbook will help you as you strive to become a better supervisor and as you continue in the quest for excellence in mathematics education in every school district in Pennsylvania.

Genevieve Battisto - Pocono Mountain School District
Swiftwater, PA 18370

John Kerrigan - West Chester State College, West Chester, PA 19380
Co-Chairpersons, Handbook Committee

CHAPTER I

SO YOU'RE A MATHEMATICS SUPERVISOR

B. Ross Taylor
Minneapolis Public Schools
Minneapolis, Minnesota

A. INTRODUCTION

If you are a new mathematics supervisor, this chapter is written especially for you. It consists of a collection of ideas that mathematics supervisors have found to be successful in practice.

We recognize that each supervisor has a unique style and that there is wide variation between school systems and between the job descriptions of mathematics supervisors. Consequently, not all of the ideas in this chapter will be useful for all supervisors. However, we feel that every mathematics supervisor, expecially a new one, can gain some useful ideas from it.

We believe that a vitally important idea for you as a new supervisor is to belong to, and be professionally active in, the National Council of Supervisors of Mathematics. The information you gain and the contacts you make will be invaluable.

B. RELATING WITH OTHERS

Getting Started

As a new supervisor, you should follow the advice of Professor Harold Hill ("The Music Man") and get to know the territory. Even more important, you should get to know the people. A schedule of visits to the schools for which you are responsible should be very high on your initial list of priorities. You should make a concerted effort to learn the names and faces of key people as quickly as possible. A list of names of mathematics teachers, key administrators, and clerical personnel is helpful

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to have before going into a building. If names are memorized in advance, the names and faces can be associated quickly. After each visit you should go over your list periodically to keep the names and faces fresh in your mind. The extra effort involved will prove to be of high value, because people tend to react very favorably to supervisors who can address them by name at their second meeting.

On the first visit to a building, you should begin by meeting with the principal to learn about the school, the mathematics program, and the principal's perceptions of mathematics teachers. Offer the principal your support and cooperation. Then, if possible, meet informally with individual teachers or small groups of teachers. The first visit is one of getting acquainted, and the primary objective is to establish rapport with the school staff.

You should make a similar effort to learn the names and faces of members of the central office staff (and, in a decentralized system, key members of area staffs). In the process, you will become more knowledgeable about the administrative structure and manner in which it functions. You will find this information is extremely valuable as you work to improve the mathematics program.

Communicating With Others.

When people feel that you are glad to see them, they will be glad to see you. Consequently, you should make a point of going out of your way to greet people with a smile and a hello. Make a habit of introducing yourself to people. Also, remember that most people prefer to have you ask them about what they are doing rather than to hear about what you are doing. As you strive to improve the mathematics program, you must begin with things as they are, so you should begin by learning what people are doing and why.

To be effective, you will need to build trust. That involves letting teachers and others with whom you work know exactly what you have in mind.

If they feel that you have hidden motives, they are likely to treat you with suspicion. If you say one thing and then do another, or if you do things arbitrarily without giving your rationale, you will lose credibility in a hurry.

Some of the most important skills you will need as a supervisor are communication skills. Listening is a vital skill that is often overlooked. In working with others, you must not only understand what they are saying, you must let them know what you understand them to mean. You can accomplish this by rephrasing what they say in your own words. In this way they will be reinforced by knowing that they are getting through. Furthermore, the act of rephrasing what they say will help you remember the key points of discussion.

When we visit schools, we often go with preconceived ideas about what we will find. If you are looking for bad teaching, you will find it. On the other hand if you are looking for inspired teaching and ability to relate with students, you will find that, too. You will receive a much more open and cordial welcome and be in a stronger position to influence the program, if you concentrate on identifying and building on the strengths of the staff, rather than focusing on its weaknesses.

Teachers and administrators tend to react favorably to the positive reinforcement they receive from being praised. Therefore, whenever you encounter some activity or accomplishment that is worthy of praise, be sure to give it. Where possible, you should let others, paritcularly the person's superiors, know of the praise.

You must be able to level with people. For example, if you have a constructive suggestion for a staff member, you should convey your feelings through a frank discussion. Such a discussion should be conducted in a private meeting with the person. This way you can be perfectly candid without embarrassing a person in fornt of peers of superiors. When you can sit down in private and level with the teacher about any reservations you have about the teacher's work, you will have established a satisfactory teacher-supervisor relationship. At that point, your praise will become even more meaningful because the teacher will be certain that you are sincere.

Words of praise are often most effective if they are put in writing, with copies sent to the person's superiors. On the other hand, there are only certain times when words of criticism should be put in writing. Supervisors should avoid embaraassing people or putting them on the defensive. However, if, as a supervisor, you have responsibility with respect to the continuation of the person in the position and the concern is a significant enough to influence that continuation, then the person should recieve written documentation of your concern. Before taking such a step, you should check with your superior and your personnel department to be certain that you will have support and that you are acting in accord with school district personnel policy. You should supply a copy to the person involved and receive the person's reactions before you supply the information to anyone else. Evaluation of teachers is usually the responsibility of the school principal, so you should check with the principal before taking any action involving evaluation of a teacher.

Relating With Your Boss

A most important personal relationship for you as a supervisor is your relationship with your immediate superior--your boss. If you have a relationship of mutual trust and respect, then you are in a position to have a profound influence on the mathematics program and you should find that your job is a very rewarding professional experience. As a supervisor, you should be drawing a substantial salary. For your district to receive a fair return, you should have responsibility commensurate with your position and salary. A supervisor should not have to run to superiors or cut through meters of red tape for every trivial decision. In most situations, superiors recognize that the mathematics supervisors have more expertise in the field than they do, and they are willing both to delegate responsibility and to listen to the recommendations of the supervisor. You should build a close working relationship with your immediate superiors and you should keep them informed of any new actions you plan to take. If you have any substantial communications with persons higher in the administrative structure

than your immediate superior, then you should keep everyone in the direct chain of command informed. For example, suppose you report to a curriculum director who reports to an associate superintendent who reports to the superintendent. If you send a memo to the superintendent, then the associate superintendent and the curriculum director should also receive copies. If your boss is ignorant of certain of your activities, inquiries about these activities that come from higher up can be a source of great embarrassment for your boss.

The times that supervisors usually have difficulty with their bosses are when the superiors feel insecure and possibly threatened by the talent of the supervisor. In such a circumstance, you have to go out of your way to convince your boss that your achievements will reflect favorably upward. Consequently, the best course of action for the boss is to see that you have the authority and resources to do the job.

Relating When You Are the Boss

If you are in a position where you have secretarial help, you will find that your secretary can have profound influence on your effectiveness. You should seek out the insights and opinions of your secretary. A secretary who is included in the decision-making process, and who is given the rationale for your decisions, will be in a much better position to accept increased responsibilities and to handle inquiries in your absence. Your secretary will probably have a better knowledge of the "nuts and bolts" operation of the bureaucracy than you, and you should make full use of the knowledge. Clerical personnel have their own "network" and you will find that often your secretary can accomplish more by working through the "network" than you can accomplish by working through the administrative bureaucracy.

Even if you do not have direct "line" responsibility for teachers, you will find that they will consider you as their "boss". In many cases, supervisors do have direct responsibility for classroom teachers or resource teachers. Whether the responsibility is defined or implied, the supervisor

should act in a manner to meet the expectations of the teachers. You will need to establish your credibility with teachers by letting them know that you understand their problems because "you have been there." One means of establishing credibility and gaining empathy is to teach some classes. Direct contact with students also tends to remind you of your ultimate objective of providing them with the best learning environment possible.

Projecting Yourself

You will find that your attitude toward the job is contagious and there is nothing as contagious as enthusiasm. You will find also that you will be more effective if you don't take yourself too seriously. Maintain your sense of humor and your ability to poke fun at yourself. If you do, you will find yourself much more able to accept criticism and take constructive action.

Treat parents as if you are in business and they are customers. You want them to be satisfied "customers," so help them get the service that they expect from the school system.

C. BUILDING LEADERSHIP

Identifying Potential Leaders

There is a limited amount that you, as a mathematics supervisor, can do by yourself. You can greatly magnify your impact by drawing on the talents of creative, competent people. In particular, you should identify the teachers who have the greatest potential for providing inservice activities and developing curriculum. Then you should strive to provide them with the resources to accomplish the task at hand.

If you exhibit enthusiasm and display a sincere interest in helping to improve the mathematics program in the schools, then the teachers with leadership potential will tend to gravitate toward you. However, do not be misled into believing that the best talkers are necessarily the ones with the most potential. You have to look continually for the potential in every teacher, because some of those with the most to offer are by nature quiet and

withdrawn. You can separate the talkers from the doers by inviting them to perform tasks such as curriculum writing or the leading of a workship. Then you can see how well they produce. As they gain experience and demonstrate proficiency, you can expand the scope of what you ask them to do. Some teachers prefer to work in pairs or in teams. That is fine and should be encouraged. However, at an early stage, you should make efforts to determine which members are making a contribution to the team effort and which, if any, are not. That can be accomplished by identifying the specific accomplishments of the various team members.

Stimulating Professionalism

In building leadership you want to stimulate professionalism and you must begin by demonstrating professionalism. You should be an active member of the National Council of Supervisors of Mathematics, as well as the National Council of Teachers of Mathematics. In the state and local affiliated groups of the NCTM, you should demonstrate leadership by serving on committees or as an officer, by speaking at sessions or leading workships, and by contributing to the publications. You can be an important force in strengthening your state and local affiliated groups and in strengthening NCTM participation in your area. You, more than anyone else, are in a position to identify teachers who show potential and to recommend them for leadership opportunities with the professional mathematics education groups. In the process, you make a contribution toward strengthening the profession, while, at the same time, building professional leadership within your school system. You should recommend teachers who have demonstrated leadership at the local or state level for positions of leadership with the National Council of Teachers of Mathematics. Attempts to involve teachers in activities of the NCTM are helped when school districts provide substitute service and travel funds for them.

Providing Reinforcement

In some cases you will be able to obtain funds to pay teachers to write on curriculum projects or to lead inservice activities. In general, you will receive the greatest return from those funds if they are invested in teachers who are active in professional mathematics education organizations. Whenever

you ask a teacher to lead inservice activities or to do curriculum writing, you are indicating your confidence in the teacher's ability. Many times you will not be able to offer financial reimbursement for leadership activities of teachers. However, you can always offer them praise and recognition, particularly for their professional activities. One way to do this is to write a letter to the teacher, recognizing the teacher's professional contribution, and send copies to the principal and to the personnel department. In the process, the teacher's leadership potential is pointed out to the principal. You will find that a teacher who has received such a letter is usually very responsive to future requests to serve in various leadership capacities. Surprisingly, employees generally consider that recognition and the opportunity to be heard are more important than salaries or fringe benefits. As a supervisor, this phenomenon works in your favor. While you are generally not in a position to influence salaries or fringe benefits, you are in a position to offer recognition and to help teachers influence the decision-making process, and you should make the most of it.

Delegating Responsibility

As you embark on various projects, you should delegate responsibilities to others so you can maintain freedom to meet the various needs that emerge. If you have made an effort to identify potential and build leadership, then you should be able to delegate responsibility with confidence. Persons to whom you delegate responsibility should know that they have a right to fail in an undertaking. A responsibility undertaken involves risk. If you do not take a few risks, you are not likely to improve the mathematics program. Of course, while individual failures should be accepted, general patterns of failure should not.

If you are to surround yourself with competent people and delegate responsibility to them, you have to be secure in what you are doing. You must not feel that you have to know everything that everyone else knows and a few things more. You should seek out persons who know things that you do not know and can do things that you can not do. Then, when you give them the chance to use their knowledge and "do their thing," you will be exercising

true leadership, and you will find exciting things happening to the mathematics program in your schools.

D. MAKING IT HAPPEN

Providing Personal Leadership

As mathematics supervisor, you are in the key position to make things happen in mathematics instruction in your district. Everyone will look to you for leadership and inspiration. Your attitudes and actions can set the tone for mathematics instruction throughout your schools. Your ability to show imagination and to think creatively can stimulate creative activity by teachers in your schools. Many times the limiting factors on what you can do to improve your mathematics program are primarily the scope of your imagination and the amount of money you can obtain. However, with sufficient imagination, you can often secure the money.

There are two basic types of power associated with leadership. One is the power that comes from the position the person holds. There is only so much power with each position. It appears that, whenever some power that emanates from the position is used, there is less power remaining. The other type of power, which we will call personal leadership power, stems from the person's ability to build the confidence of others. Each time personal leadership power is used effectively, the person gains more power because more confidence has been gained. As a mathematics supervisor, the amount of your position power depends on how your job is defined. However, as a mathematics supervisor, you are in a position of high visibility with a great opportunity to develop and use the power that stems from personal leadership. This means that even if your job is defined so that you have limited authority, you are still in a position to have a great deal of influence.

Finding the Resources

You will find that the occasions will be rare when you are provided with all of the funds and personnel you feel you need to accomplish your objectives. Consequently, you will have to stretch every dollar and you will have to seek additional resources. Familiarize yourself with potential sources of funds--federal, state, and private. Look for situations where you can be influential in directing resources toward the improvement of the mathematics program. For example, through other departments, an imaginative supervisor can obtain services such as federal programs, research, library, audio-visual, data processing, special education, or vocational education. Private industry can often be persuaded to supply resources, particularly when the process is accompanied by favorable publicity. Good relationships with nearby colleges and universities can be beneficial, particularly in the area of inservice training.

Getting It Together

Before you embark on a project or a course of action, you should have clear objectives, preferably stated in writing. You should also have an accurate assessment of the present state of affairs. The difference between your objectives and the present status determines what needs to be done. To improve your mathematics program, your best strategy is usually a pragmatic approach in which you determine where you are and where you want to be. Then you make as much progress as possible toward your objectives in a series of stages. For each stage, you do those things which promise to carry you farthest toward your objectives in light of the time and resources available. At the end of each stage, there is a reassessment of the status and sometimes a reexamination of the objectives. Such a process is called using successive approximations.

There are always many more things that need doing than you have time and energy to do. To maintain your effectiveness, you must set priorities and concentrate on a few things with the highest priorities. You must learn to practice "selective neglect" of those things which have lower priorities.

You will be better off to do a few things well, rather than to do many things poorly.

Do not, for a minute, think that it is your role to come up with all of the ideas. Such an approach is likely to fail due to lack of support from teachers and administrators. Many of the best ideas come from teachers because they are in a position to know what can be successful in their classrooms. For a program to be successful, it must have the support of teachers. The best way to get that support is to have teachers meaningfully involved at every step along the way. In particular, they should have a major voice in selecting objectives and assigning priorities.

As mathematics supervisor, you are constantly attempting to maximize your impact on the quality of the mathematics program. In the process, you should try to identify the weakest parts of the program and the strongest members of the staff. Then make full use of those strenghts to eliminate the weaknesses.

Conducting Meetings

As mathematics supervisor, you will frequently find yourself chairing meetings. The first thing you should do is to be certain that the meeting is necessary. Think of the cost of the meeting in terms of the time invested by the participants. For example, a two-hour meeting involving twenty-five people, whose time is worth an average of $10 per hour, consumes $500 worth of time. In general, set up task forces rather than committees. A task force disbands when the task is completed.

For meetings which are necessary, participants should be notified well in advance. An agenda should be sent out before the meeting--perhaps with the meeting notice-- so that participants can prepare themselves. It is often desirable to allot an amount of time to each item on the agenda. Meetings should start and end on time. They should have a friendly atmosphere. Having refreshments available tends to help participants be more sociable and relaxed so that communication is better. The leader should make it easy for participants to learn each others' names. People can be introduced

or they can identify themselves when they speak. A list of participants can be provided. Name tags, or name markers on the tables in front of the participants, can be used.

Once the meeting is in progress, you must keep it moving. See that the group sticks to the agenda and to the time schedule. Do not allow the meeting to be monopolized by one person or by a small group of people. Strive to get everyone actively involved. If necessary, call on those who do not speak up. Long meetings need periodic breaks. Sometimes withdrawn participants start to get involved during the breaks, particularly when refreshments are served.

Minutes of meetings should be clear and concise. They emphasize what action is to be taken as a result of the meeting, by whom, and when.

Getting Something Going

If you want to start a new course or try a new idea, you need to find teachers who think the idea has potential and who want to try it out. Often, teachers themselves will come up with an idea and seek your support. If an idea that has support of the teachers and administration is tried out under favorable conditions and fails, then you will know not to try it under similar circumstances in other schools. If an idea fails in a particular setting, you need to know if it was a bad idea or if it was a potentially good idea that was poorly implemented. On the other hand, if the idea turns out to be successful, then you may want to implement it on a broader scale. The teachers initially involved will be able to provide inservice for the teachers in the new locations. Whenever you follow this plan, you will be able to take risks knowing that you will be able to minimize the effects of the failures and maximize the scope of the successes.

A key part of your job is to spread information about the successful ideas and practices you observe as you go from school to school. Teachers are reinforced when you recognize their work and when other teachers adopt their ideas. Teachers are also most receptive to ideas that have been successful in classrooms similar to their own. There is no one

who has more credibility to a teacher than another teacher.

Whenever you start a curriculum project, you should get something tangible produced in a hurry. This will give the project initial visibility and credibility. When you seek continuation of funding for a project your job becomes much easier if the project can exhibit visible evidence of success.

Influencing Decisions

You must recognize that educational decision-making is often a political process. Decisions made by the administration or the board of education may sometimes appear not to be logical. Your study of mathematics has made you a careful, logical thinker. You may have difficulty accepting decisions that do not appear to be rational, particularly when you feel that they adversely affect the mathematics program. However, if you keep in mind that political factors weigh heavily in educational decisions, you will be in a better position to influence those decisions. Get to know the power structure within the school system and within the community. Learn who the key people are and find out which factors influence their decisions. Use this information to help you obtain decisions that will help the mathematics program. In the process, be ethical and do not do anything that would undermine your integrity.

Avoid getting involved in win/lose battles. Even when you win a battle, you lose because you make enemies. If you face a problem with someone, rather than getting locked into battle, use the mathematician's technique of redefining the problem in a manner that makes it easier to solve. In cases where you must take a stand, try to do so in a manner that will not put anyone on the defensive.

You will encounter and observe frustration at various times in your job. You will probably be involved in the generation of frustration at various times. That is all right if you generate creative frustration. For example, if teachers become dissatisfied with portions of their mathematics

program, a force for constructive change has been produced. Sometimes community or teacher influence resulting from creative frustration can help the decision-maker see the wisdom of allocating necessary resources to the mathematics program.

Anticipating Questions

As a mathematics supervisor, you should be able to anticipate the questions that might be asked by the administration, the school board, the press, and the public. For example, they may want to know what you are doing about the metric system, calculators, computers, declining test scores, basic computational skills, problem solving, women in mathematics, minorities in mathematics, gifted students, low-achieving students, and so on. If you have anticipated the questions, then you should be able to describe what has already been done, what needs to be done, and what plans you have for the future. Generally, you are better off to be open and frank in your responses. If you clam up, get defensive, or tend to place blame elsewhere for inadequacies of the mathematics program, you will be setting yourself up for a very difficult time. On the other hand, if you are open about the problems that are yet to be solved, as well as the ones which have been solved, you are likely to find that people will want to help you solve the remaining problems. Remember that, if you have solved all of the problems related to mathematics education in your school district, you are no longer needed as mathematics supervisor.

You should know the pulse of the faculty, the administration, the school board, and the community. Then, as you strive to improve the mathematics program, you will select as priorities things which are most likely to be accepted and supported. You can also plan to take actions at times when they will be most likely to gain support.

Maintaining Visibility

You should maintain high visibility, particularly with the mathematics faculty and the administration. Make it a point to be a frequent visitor

to schools. Whenever you are in a building, say hello to as many teachers of mathematics and school administrators as possible. A half hour at recess time, in the teachers' room of an elementary school, will bring you into contact with many of the teachers in the building. Have your name included on printed materials which relate to the mathematics program, but do not allow yourself to be given credit for what others have done. Establish a positive working relationship with members of the local press and other media. Work with your school system's public information personnel to help publicize successful activities through brief oral presentations or written reports. Maintain visibility, but avoid being a windbag or a showoff. Follow the advice of Senator Muskie and speak only as you can improve on silence.

E. WORKING SMARTER RATHER THAN HARDER

Using Your Time Effectively

If you are like most mathematics supervisors, you don't have the time to do all the work that needs to be done. You may try to handle the situation by working evenings, weekends, and vacations. Even then you will find that there is more than enough work to keep you busy twenty-four hours a day, seven days a week, fifty-two weeks a year. Peter Drucker has advised executives who become swamped with work that they should work smarter rather than harder. The remainder of this chapter consists of some suggestions which can help you be more efficient in your job as mathematics supervisor.

Each year you should write down a list of objectives you wish to accomplish during the year. Assign proprities to them and proceed to concentrate on the four or five that have the highest proprity. For each of these objectives consider alternative ways to accomplish the objective, work out a plan of action, and set up a timetable. Concentrate on essentials. Periodically, check your progress against the timetable.

Take a survey of how you spend your time over a couple of days by jotting down briefly what you do in each half-hour time block. See how much of your time is spent on your priority objectives. If you find that you are spending fifty percent of your time on five percent of your improtant problems, you need to restructure your use of time. See if your time is spent primarily as a reactor or if you are able to find sufficient time to initiate actions

that will improve the quality of your mathematics program.

Looking Ahead

Continually look and plan ahead. At the beginning of each week you should check to see what events and meetings are comming up in the next two weeks. This will give you time to prepare and to get out the necessary notices. For inservice meetings you should plan much farther in advance, perhaps several months. A well-planned inservice is a joy to conduct, but a poorly planned one can be a nightmare. Maintain a "things to do" list, checking off items as they are accomplished and adding new ones as necessary.

If you have a secretary, maintain dual appointment books and carry one with you while leaving the other on the secretary's desk. In that way, people can be informed as to your whereabouts, your forthcoming schedule, and your anticipated time of return. If you do not have full-time secretarial help, you should at least have a telephone number for people to call that will be answered by a person who can take messages for you and who knows your schedule for the day. When you are out in the schools, you should call your office periodically to report any changes in your itinerary and to take any important messages.

Handling Phone Calls

As a mathematics supervisor, you want to be accessible, particularly to teachers and administrators. However, you do not want to be so accessible that you can not make any progress toward your objectives. Where possible, incoming phone calls should be screened by a secretary. If you are occupied in a conference with someone in your office, you should not be interrupted unless the call is especially important or urgent. To get your work done without interruption, you will probably have to set times when you have the secretary hold the incoming calls. The alternative is to find some place to go and "hide" when you do your work. Many of the calls you receive do not need immediate response. If you call back within a few hours, or, at least, within twenty-four hours, you will be considered to be responsive.

But, do, without fail, return every call you receive.

Handling Visitors

You also have to place limits on your accessibility to visitors who stop in to see you at the office. If your secretary makes appointments for you, you should block our certain times for visits to schools, when you need to be free of all other appointments. Some supervisors set aside one or two days a week exclusively for school visits. If you do not follow such a procedure, you may find that your calendar will fill up with appointments with publishers' representatives and miscellaneous visitors.

When you meet with a visitor, you should establish at the beginning just how long you plan to meet and what you expect to accomplish. In that way, you can avoid long rambling conversations which do not accomplish anything. You should have copies of learning materials or activities which you can give to teachers who stop in the office requesting help. Then, even if you have limited time to give them, they will go away satisfied.

You should have a plan for handling the "drop-in" visitor who, more often than not, is a publisher's respresentative. Some supervisors make a policy of meeting only with representatives who have set up appointments in advance. You may prefer to deal with them briefly on the spot to avoid tying down your calendar with a later meeting. You can make visits by "drop-in" visitors brief by beating them to the office door and having a brief stand-up meeting just outside the office. If you do not make it to the door in time, you can handle the situation by standing up and having a brief stand-up meeting in front of your desk. However, do not shake off salespeople as necessary evils. They have a job to do and most of them are trained to do it well. They will recognize that imposing on your time is not a way to gain favor. Remember that these people often travel to many other districts and have up-to-date information from their companies. They can be a great source of information and can help you do your job in many ways. Be friendly, but cautious.

You can cut down on the number of visitors you see by handling the business efficiently and briefly over the phone when they call for an appointment. You will find that your phone is an extremely valuable communications device because you can use it to conduct business with a large number of people in a brief time.

Handling Your Mail

In addition to phone calls and visitors, the main type of input you receive is from your mail. If your mail is opened by a secretary, have it sorted into several categories (for example, correspondence and items that require action, publications reports that do not require action, advertising material and catalogues of learning materials). Take prompt action on those items that require it and get to the other things as time allows. Learn to skim and to be selective in what you read.

Do not be a squirrel. Get a large waste basket and use it. Use the adage, "When in doubt, throw it out." If you have trouble doing this, reserve a drawer for the doubtful things and then give it a periodic purge. As a supervisor, you will have a large quantity of learning materials, particularly publishers' samples, come through your office. You may find that you have more than you want or are able to store, but still you do not want to throw the materials away. In that case, take the materials to your next meeting of teachers and give them away. Then you should have no qualms about discarding anything that the teachers do not want.

You should have a well-organized filing system with information that is likely to be requested readily available at your fingertips. You may want to keep important current information close at hand in looseleaf notebooks. A teacher who calls requesting information about learning materials, courses, or whatever does not want to wait several days while you try to dredge up information. Furthermore you want to keep your time and your mind as free as possible by completing the business from as many calls as possible right on the spot.

Delegating Tasks

You can improve your efficiency by delegating every task possible that can be performed by someone else, particularly tasks that can be done by persons who receive less remuneration than you. It makes no sense for supervisors to perform secretarial duties like typing and filing. Furthermore, students whose help is available to you free, through the Neighborhood Youth Corps program or other programs, can relieve secretaries of chores such as collating and addressing envelopes. Often you can delegate responsibilities to teachers. On the other hand, you should avoid having responsibilities delegated to you by teachers or clerical staff. For example, teachers working on a curriculum project can end up turning the material back to you for major editing and rewriting. After awhile you could end up doing most of the work yourself. Review the material and give your reactions and suggestions, but leave the editing and rewriting to one of the competent teachers whom you have identified.

Providing for Personal Needs

If your school system arranges for inservice opportunities in leadership or management skills, take advantage of them.

Set up your schedule so that your activities will be varied, enabling you to work at full capacity all day long and all week long. Do not spend long stretches of time in bureaucratic paper shuffling chores. Break those times up with school visits because of the reinforcement you receive from students, teachers, and administrators. When you visit, you are keeping in touch with the ultimate concern of your job--the mathematical education of students.

Finally, allow ample time for your personal needs--for family and friends. Plan to do a variety of things such as reading, attending plays and concerts, visiting museums, going to sports events, participating in sports or hobbies, traveling, etc. The experiences will broaden you and enable you to communicate more effectively with your peers in other disciplines. You will find that if you save some time for your self you will get more enjoyment out of life and

you will also have more to give in your job as mathematics supervisor.

F. CONCLUSION

As a mathematics supervisor, you must learn to relate effectively with others. You must develop leadership in teachers and delegate responsibility to them. You must provide dynamic personal leadership. Finally, realizing that you can not do everything, you must be selective and efficient in what you undertake. If you can do these things, you will find that being a mathematics supervisor is both personally and professionally rewarding. Furthermore you will have a powerful impact on helping kids learn mathematics, and that is what it's all about.

CHAPTER II

TYPES OF MATHEMATICS SUPERVISORS AND THEIR SPECIFIC DUTIES

The types of mathematics supervisors are as varied as the different school systems in Pennsylvania. Generally they may be divided into three categories; The K - 12 mathematics supervisor, the mathematics supervisor for secondary schools within a district, and the mathematics supervisor for a specific school within a district.

The title that is given to the person who has the responsibility of the supervisor is also different from school system to school system. Some of the different names are department chairperson, department co-ordinator, department head, or department supervisor. In this chapter the term mathematics supervisor refers to the K - 12 person while the term department chairperson refers to the two other categories.

This chapter will define the positions of supervisor and department chairperson and list the duties and responsibilities of each.

A. The K - 12 Mathematics Supervisor

A K-12 Mathematics Supervisor is usually employed in a larger school system whether urban, suburban or regional. This position is most often an administrative one, fully released from assigned teaching duties. On occasion, however, some teaching assignment may be part of the job.

The major responsibility of the K-12 Supervisor is the overseeing of the mathematics program in a particular district. This responsibility includes monitoring of actual teaching through observation and conferences with teachers. Rating responsibility is not usually the supervisor's. This most often rests with the principal, with the supervisor as a support person. It is the supervisor's job to make recommendations for the improvement of teaching, such as: suggested strategies, alternative approaches, and helpful activities. On occasion, the supervisor may actually teach a class for demonstration purposes or to provide enrichment for the students.

Outside of the classroom, the K-12 Supervisor has many responsibilities. A major portion of the supervisor's time may be spent in the development and revision of curriculum. Courses of study, teaching guides and other supportive material may be written or modified by the supervisor. Sometimes a committee consisting of the supervisor and several teachers will produce curriculum.

Textbook evaluation, too, is another curricular responsibility for the K-12 Supervisor. In a district which adopts a single text for each course, the supervisor may work with teachers and other administrators to make the final decision. If a number of texts are listed for teacher choice, the supervisor may have sole responsibility in making a final selection. Often a supervisor may be involved in setting up a curriculum center where samples of texts and other materials may be examined by teachers. Finally, a supervisor may be called upon to demonstrate the use of materials in the classroom.

Staff development is a large part of the K-12 Supervisor's responsibility. A particular school may want to avail itself of the supervisor's service by scheduling departmental meetings. In this way, the entire mathematics department can meet together to participate in a presentation

by the supervisor. The presentation, itself, may be concerned with new techniques, new curriculum materials, or simply a reiteration of established programs. In larger systems; the staff development session run by the supervisor may involve several schools, or the whole district. In this case, the supervisor may be only one of a group of speakers or workshop leaders who provide the staff development.

On a more formal bases, the K-12 Supervisor may serve as an instructor in a credited inservice course for the mathematics teachers. This type of service is part of a larger responsibility on the part of the supervisor in encouraging professional development among all the teachers. In addition to offering courses and teaching, the supervisor may also encourage teachers to participate in other professional activities, such as: conferences, conventions, and other types of meetings. Membership in professional organizations should be encouraged by the supervisor. Reading of professional journals is also to be encouraged. It is the responsibility of the supervisor to know current trends, materials, research and other important information which may affect the teaching of mathematics. This information, in turn, should be disseminated among the teaching staff.

There are other responsibilities which a K-12 Supervisor may have. In larger districts, special mathematics programs may be developed for specific groups of students or a special magnet school may be created to serve the needs of students interested in Mathematics. The K-12 Supervisor would have input in the development of these programs. Once the programs are implemented, the supervisor would have a role in monitoring their progress.

A further extension of the K-12 Supervisor's duties may include participation in programs which involve parents and other community organizations. The supervisor may interpret curriculum guides, tests, and other materials used in the mathematics program for parents, and may provide information about specific programs to community groups interested in education.

As a more general type of service the supervisor would be constantly involved in fostering articulation between different levels of instruction, different schools, and groups of teachers and administrators in general. In this way, a mathematics program would run more smoothly since at each step, there would be knowledge of what comes before and after in the continuum.

The duties of the K-12 Supervisor are many and varied. Each school district defines these duties according to size and needs, but the overall impact of having a K-12 Supervisor is to have a constantly improving mathematics program.

B. Mathematics Supervisors For Secondary Schools Within A District

The mathematical leadership in a majority of Pennsylvania school districts rests with a department chairperson. Generally, the mathematics department chairperson is a secondary teacher who assumes a leadership role for grades 9 through 12 or grades 7 through 12 while teaching a regular or limited class schedule. The department chairperson assumes many of the duties of a mathematics supervisor, but may not hold a supervisory certificate nor be as directly involved in teacher evaluation. The chairperson works with a district curriculum coordinator, often an assistant superintendent, who is responsible for the entire curriculum throughout the district. The chairperson's position guide or list of duties is generally limited to the secondary school, yet this person is the district "math expert" who perfoms a wide variety of tasks which are instructional, curricular, supervisory and administrative in nature.

In most school districts the mathematics department chairperson teaches regularly scheduled classes but is provided released time to perform departmental duties. As a guideline, PCSM recommends that chairpersons of a department with 1 to 6 members teach at most 4 periods per day, those with departments of 7 to 12 members teach at most 3 periods per day, and chairpersons whose departments have more than 12 members teach at most 2 periods per day. The chairpersons should have experience in teaching a

variety of mathematics courses and different levels of learners. This will enable the chairperson to work effectively with department members in planning for their teaching assignments and providing other supportive services to mathematics teachers.

The department chairperson assumes the responsibility for the development of the mathematics curriculum in his/her school(s). The chairperson must direct the preparation of courses of study and see that they are updated periodically. The chairperson also leads the department in proposing new courses for addition to the curriculum. Most mathematics departments are offering additional courses related to computers and revising existing courses to enhance them with computer applications. While a department chairperson may not have a direct responsibility for the elementary program he/she must be aware of the curriculum development at that level so as to insure a continuity within the mathematics program. As the mathematics specialist for the school, the chairperson must work with the librarian in recommending the purchase of pertinent and current mathematics reference texts and periodicals both for the use of faculty and students. The chairperson also advises the audio visual department of media materials and programs which should be made available for mathematics instruction. In order for the chairperson to be fully informed about the latest in mathematics programs and materials he/she should attend workshops and conferences sponsored by professional mathematics organizations. Participation by the chairperson on school evaluations and accreditations teams also serves to broaden perspectives and further acquaint him/her with new ideas and situations.

The mathematics department chairperson should be a master teacher who is able to confer with members of the department to offer commendations and recommendations about techniques. The expertise of the chairperson should serve as a model for other mathematics teachers. The chairperson should be willing to teach a demonstration lesson for a teacher upon request or provide any teacher in the department with an opportunity to observe the chairperson in one of his regularly scheduled classes. In particular, the chairperson

must orient new teachers to the policies and procedures of the mathematics department and help them to adjust to the teaching profession. The chairperson is often responsible for assisting substitute teachers who may be in the school buildings on a daily or short term basis. It is the on - going task of the mathematics chairperson to encourage instructional improvements and professional growth among department members.

There are many day to day duties which the chairperson must perform to insure the smooth functioning of the department. Meetings of the mathematics department must be well planned and an accurate record of departmental business kept. The chairperson must advise the school guidance department in the scheduling of students in mathematics classes according to their needs and abilities, and confer with the school administration on staff assignments which best accommodate the talents and preferences of the mathematics teachers. The chairperson must assist in screening applicants for mathematics teaching positions to insure subject matter competence of the candidates and to provide for a balance in areas of strength within the mathematics curriculum.

The department chairperson is generally responsible for such administrative tasks as inventoring books and supplies, requisitioning and distributing mathematics materials and preparing the annual department budget. In order to be aware of the availability of new texts and materials, the department chairperson meets with educational salespersons to discuss and evaluate their products. The chairperson prepares other reports requested by the administration. These may include grade distributions, reports of special events in the department, and parent information items.

The department chairperson knows the needs of the mathematics staff and therefore is an important resource for the school administration in planning for inservice. The chairperson may actually conduct an inservice program, but more often he/she suggests topics of interest to teachers which should be included in the programs and recommends speakers or workship leaders who present these topics.

The mathematics program in any school district is not an independent

entity but must fit into the total school program. Therefore the mathematics department chairperson must be able to work in concert with the leaders of other departments. The chairpersons of all departments should meet periodically as a group with the building administrators and serve as an advisory council in the formulation of school policies. This group should promote interdisciplinary projects and studies which focus on the global nature of education. Since mathematics is such a basic tool for learning the mathematics chairperson should be prepared to consult with other chairpersons about the application of mathematics to their disciplines. There should be a particularly close communication between the science and mathematics chairpersons.

C. Mathematics Supervisor For A Specific School Within A District

The department chairperson in a specific school is a teacher with some additional administrative duties. This person is generally directly responsible to the principal of the building. The duties of this person parallel those of the mathematics supervisor for a district. Therefore see the list for the previous category. Because this person does not have the time, only a few of the duties listed are applicable.

CHAPTER III

Certification Requirements For A Mathematics Supervisor In Pennsylvania

A. State Requirements

The Pennsylvania Department of Education has established the following requirements for certification as supervisor of mathematics.

> "In Pennsylvania the Supervisory Certificate is distinct from the Administrative Certificate. A supervisor's primary responsibility is to direct a program and the personnel involved within that program in a specific field."
>
> "There is no reciprocity for supervisory certification between Pennsylvania and other states in which Supervisory Certificates are available. Eligibility for the certificate is determined on the basis of evaluation by the Pennsylvania Department of Education, Bureau of Teacher Certification."

Requirements of the Mathematics Supervisory Certificate are:

1. Earned Master's degree.
2. A graduate level academic concentration (approximately 15 graduate credits) in mathematics. These credits may be earned within or outside the master's program.
3. A graduate level supervisory competency sequence:
   a. Theories and techniques of school supervision.
   b. Patterns of school organization and administrative channels.
   c. Group dynamics/ Interpersonal Relationships/ School Leadership.
   d. Application of research findings and reports.
   e. School curriculum design and development.
4. Hold the Pennsylvania Instructional or Educational Specialist Certification in mathematics.
5. Five years of satisfactory professional experience in mathematics.
6. Signature of Superintendent and copies of all professional certificates.

B. Model Certification Programs in Pennsylvania Colleges.

The Pennsylvania Department of Education (PDE) has approved programs leading toward the supervisor of mathematics certification at eleven colleges and universities. Any programmatic deficiencies in a student's background related to a PDE - approved preparation/certification program leading to the Supervisory Certification, will be determined by the PDE - approved college or university. That institution will perform the evaluation and take the responsibility for verifying the applicant's requirements.

Because of this last fact, it becomes important to look at each college and university and examine its prerequisites, program requirements, and course offerings.

1. Beaver College
   a. Prerequisites:
      (1) A Master's Degree in the field in which Supervisory Certification is sought.
      (2) A previous record indicating the ability to do graduate level work.
      (3) An Instructional II Pennsylvania Teaching Certificate.
      (4) A score of 47 or more on the Miller Analogies Test.
   b. Program requirements:
      (1) Foundations Courses (9 credits)
          ED 502 -- Seminar: Curriculum Development and Design
          ED 404 -- Human Relations
          ED 410 -- Interpreting Educational Research
      (2) Core Courses (15 - 18 credits)
          ED 474 -- Supervision: Theories and Principles
          ED 5__ -- Supervision in the Chosen Field (Special Education, Early Childhood, Reading, Elementary Education, Mathematics)
          ED 531 -- Management of Organization
          ED 536 -- Advanced Seminar in Supervision
          ED 500 -- Practicum in Supervision (6 credits) required for certification.
      (3) Certification Requirements
          1. An Instructional II Pennsylvania Teaching Certificate.

2. Practicum in Supervision (6 credits) required for certification.
3. Comprehensive oral examination (no credit).

c. Additional Information

At the urging of our own master's degree graduates a program in Supervision was developed in the Fall of 1979 and is being offered. The program prepares teachers for the position of department chairpersons or supervisors in mathematics.

d. Contact Persons

(Mrs) Renee Magid, Coordinator.
(215) 884-3500, extension 357
Dr. A. Richard Polis, Department Chairman.
(215) 885-7410 or 572-5052

2. Bloomsburg State College

a. Prerequisites:

(1) Earned master's degree.
(2) Concentration in mathematics.
(3) Four years teaching experience in mathematics.

b. Program requirements:

(1) A minimum of 15 semester hours of graduate courses from the following areas:
   (a) School supervision
   (b) Legal implications of budget preparation
   (c) Group dynamics
   (d) Research techniques
   (e) Curriculum development

c. Course offerings:

(1) Middle Schools - Curriculum Development and Instructional strategies.
(2) The Development of Secondary School Curriculum
(3) The Department Chairperson - Workshop
(4) Methods of Appraising Teaching Strategies
(5) School Law and Finance
(6) Educational Research for Supervision

(7) Group Processes in Supervision
(8) Seminar in Supervision I
(9) Independent Study in Secondary Education
(10) Seminar in Secondary Education
(11) Master's Research Paper

d. Additional Information:

This program is currently being offered both on and off campus. Several school districts have requested this program at a location convenient to their teachers and the college has done so where class population warranted it.

e. Contact Person:

Dr. Charles H. Carlson, Dean
School of Graduate Studies
Bloomsburg State College
Bloomsburg, PA 19815

3. Cheyney State College

a. Prerequisites

(1) Master's degree in mathematics.
(2) Five years teaching experience in mathematics.

b. Program Requirements

The requirements are dependent on the background of the individual.

c. Contact Person:

Dr. Florence Johnson
(215) 758-2269
or
Dr. William Magill
(215) 758-2332
Cheyney State College
Cheyney, PA

4. Duquesne University

a. Prerequisites:

(1) Master's degree in mathematics.
(2) Five years teaching experience in mathematics.

b. Program requirements:

(1) Minimum of 15 hours.
(2) Curriculum component (Minimum 6 hours).
(3) Supervision component (Minimum 9 hours).

(4) Special requirements:

(a) Cognate - vary to program

(b) Educational Foundations - vary to program

c. Course offerings:

(1) Curriculum I. - The nature of curriculum, philosophical conflicts and historical perspectives; instructional modes and the learner; developing goals and objectives; innovation and change; formative and summative evaluation.

(2) Curriculum II. - Curriculum research; needs assessment; curriculum construction.

(3) Supervision I - Principles of supervision.

(4) Supervision II. - The administrative organization of the school; staffing patterns; certification; tenure; due process; legal issues; etc.

(5) Supervision III. - Field experience or field research in mathematics.

d. Contact person:

Dr. Frank M. Ribich
Associate Professor
School of Education
Dusquesne University
Pittsburgh, PA 15219

4. Edinboro State College

a. Prerequisites:

(1) Master's degree in mathematics.

(2) Three years successful teaching in mathematics.

(3) Valid Pennsylvania Teaching Certificate.

(4) Evidence of leadership capabilities and satisfactory interpersonal relationships.

(5) Recommended by the mathematics department.

(6) Recommended by the director of the school of supervision.

b. Program requirements:

(1) A minimum of 18 semester hours of graduate study - beyond the masters.

c. Course offerings:

(1) Introduction to Educational Supervision.

(2) Teacher Evaluation - Theory and Practice.

(3) Legal Aspects of School Supervision.

(4) Seminar: Communication and Interpersonal Relations.

(5) Practicum in School Supervision.

(6) A Curriculum course in the area of mathematics.

(7) Plus other courses needed to develop competencies in research, knowledge of both the elementary and secondary curriculum in mathematics.

d. Additional information:

The course at Edinboro is designed to help a supervisor acquire the competencies needed to be a team member, a technical adviser, an instructional leader, an organizer and a planner, a curriculum director, and a motivator for the release of human potential. This program was started in 1979.

e. Contact person:

Dr. Jack Williams
Dean, School of Graduate Studies
Edinboro State College
Edinboro, PA 16444

5. Millersville State College

a. Prerequisites:

(1) Master's degree

(2) Permanent certification in mathematics.

b. Program requirements:

(1) Fifteen credits.

c. Course offerings:

(1) Functions of Supervision

(2) Administrative Aspects of Supervision.

(3) Curriculum and Supervision.

(4) Clinical Practicum in Supervision.

d. Contact person:

Dr. Carl O. Schmidtki
Secondary Education
Millersville State College
Millersville, PA 17551

6. Pennsylvania State University

a. Prerequisites:

(1) Master's degree in mathematics.

(2) Five years teaching experience.

b. Program requirements:

(1) Twenty-four (24) hours beyond masters in algebra, geometry, topology, probability, statistics, analysis, and mathematics research.

(2) Nine (9) credits in supervision.

(3) Two (2) approved professional experiences (graduate assistanship or mathematics workshop leader.)

c. Course offerings:

Nine courses are offered in basic core requirements.

d. Contact person:

Dr. Harold E. Mitzel, Dean
College of Education
277 Chambers Building
University Park, PA 16802

7. Shippensburg State College

a. Prerequisites:

(1) Earned master's degree in mathematics.

(2) Hold an instructional II in mathematics.

(3) Completed recent graduate research in mathematics.

(4) Five years successful teaching.

b. Program requirements:

(1) Eighteen (18) hours in:

(a) School law.

(b) General school supervision.

(c) Curriculum trends in elementary education.

(d) Curriculum in modern secondary school.

(e) Internship.

(f) Graduate seminar in instructional strategies.

c. Course offerings:

(1) One course in each of the above required areas.

d. Additional information:

The two curriculum courses discuss curriculum in general.

e. Contact person:

Dr. Harry M. Bobonich
Associate Dean
Shippensburg State College
Shippensburg, PA 17257

8. Temple University

a. Prerequisites:

(1) Master's degree in mathematics

(2) Teaching certificate in mathematics.

(3) A 2.5 for all undergraduate,
A 3.0 for last two years of undergraduate major.
A 3.0 for master's degree work.

(4) No more then 9 hours of grades below B in graduate study.

b. Program requirements:

(1) Eighteen (18) semester hours.

(2) Course work is designed to help the student develop competencies in nine major areas:

(a) Assisting teachers in organizing for instruction.

(b) Developing and adopting curriculum.

(c) Staffing.

(d) Evaluating staff.

(e) Providing for staff development.

(f) Utilizing research and new developments in mathematics.

(g) Developing budgetary recommendations based on costs needs.

(h) Relating to public.

(i) Observing legal and ethical guidelines.

c. Course offerings:

(1) Core course.

(a) Introduction to supervision

(b) Supervision of curriculum and instructional improvement.

(c) Budgetary, legal, and communications guidelines for supervisors.

(d) Seminar in supervision.

(2) Subject area courses.

(a) Current research and new developments.

(b) Field experience in supervision.

(c) Any additional work required by the department.

d. Additional information:

Each student has two advisors: one for the general portion of the program and one for mathematics. Another major feature of the Program is its interdisciplinary nature which the school feels has been very enriching for the students and the professors. This program is also available to doctoral students.

e. Contact person:

Dr. Leroy C. Olson, Director
Supervisory Certification Program
Ritter Addition 843
Temple University,
Philadelphia, PA 19122

9. University of Pennsylvania

a. Prerequisites:

(1) Knowledge of mathematics, especially recent research and new developments.

(2) Bachelor's degree

(3) Three years of successful professional experience. (Must complete 5 years before certificate is granted)

b. Program requirements:

(1) Knows group process.

(2) Supervision skills.

(3) Observation skills.

(4) Curriculum knowledge.

(5) Organizational change.

c. Course Offerings:
   (1) Group process
   (2) Supervision
   (3) Professional Performance Appraisal
   (4) Foundations of Curriculum Development
   (5) Organizational Change
   (6) Field Experience in Supervision

d. Additional information:
   The university would be very much interested in offering an off-campus certification program in any region not presently served by some other institution.

e. Contact person:
   Dr. Allan A. Glatthorn
   Associate Professor of Education
   Graduate School of Education
   University of Pennsylvania
   Philadelphia, PA 19174

10. University of Scranton

a. Prerequisites:
   (1) Master's degree in mathematics.
   (2) Valid teacher's certificate in mathematics.

b. Program requirements:
   (1) Fifteen (15) semester hours.

c. Course offerings:
   (1) Required
      (a) Curriculum theory and development
      (b) Practicum in supervision
   (2) Optional
      (a) Educational research and literature
      (b) School finance problems for the school principal
      (c) School law
      (d) Educational mangement for supervisors

(e) Principles and practices of supervision

(f) Group dynamics

d. Contact person:

Dr. Arthur R. Goerlitz, Director
University of Scranton
Scranton, PA 18510

11. Villanova University

a. Prerequisites:

(1) Masters in mathematics.

(2) Three (3) years teaching experience.

b. Program requirements:

(1) Fifteen credits.

c. Course offerings:

(1) Theories and principles of supervision.

(2) Interpersonal relations in school supervision.

(3) Application of research and evaluation to instructional strategies.

(4) Curriculum and classroom management strategies.

(5) Practicum in supervision.

d. Additional information:

The curriculum and classroom management course is individualized to meet the needs of the student in his subject area.

e. Contact person:

Dr. John H. Durin
Villanova University
Villavova, PA 19085

Summary

The programs vary as to requirements and offerings. Most of the programs are new (having started around 1975) to the college curriculum. Many of them are for mathematics department chairpersons 7-12 rather than K-12 Supervisors.

CHAPTER IV

The Mathematics Supervisor And Evaluation

A. Awareness, Changes, Trends

Change is inherent in any educational program. Since this is an important element in the life of any mathematics supervisor, the supervisor must be aware of the factors that produce a climate for change so that mathematics programs will reflect needed reforms and provide stability. In the past three decades we have seen changes promoted by the advent of space travel, the national turn toward the metric system, the increased use of electronic calculators and computers, and the major problems caused by the term "minimal competencies". The supervisor is obligated to know current ideas and trends and to implement those which are applicable to and consistent with the local situation.

The best sources for updating the mathematics supervisor are the professional organizations dedicated to the improvement of mathematics education. The National Council of Teachers of Mathematics (NCTM) publishes two invaluable journals monthly during the school year, The Arithmetic Teacher, and The Mathematics Teacher. NCTM also publishes an extensive list of books and monographs. Its current publication, An Agenda for Action: Recommendations for School Mathematics of the 1980's., should be required reading for every mathematics teacher, school administrator and parent. Through its national and regional meeting NCTM provides opportunities for its members to hear educational leaders and to address contemporary issues and ideas.

In Pennsylvania the Pennsylvania Council of Teachers of Mathematics (PCSM) provides similar services and deals with mathematical matters that are of particular concern within the state. The National Council of Supervisors of Mathematics (NCSM) and the Pennsylvania Council of Supervisors of Mathematics (PCTM) supply additional help for those interested in the area of mathematics instruction and supervision.

A source for information that has become more prominent within the past few years is the National Assessment of Educational Progress (NAEP). Its testing program is funded by the National Institute of Education and

results of its testing program are widely reported by the press. Supervisors may obtain information and receive the NAEP newsletter by writing to NAEP, Suite 700, 1860 Lincoln St., Denver, Colorodo 80295.

Not to be overlooked as a source are the many colleges and universities in Pennsylvania. Through their programs in continuing education, teacher education, and mathematical conferences these institutions remain a vital source for assistance in improving mathematics instruction or changing the mathematics program.

B. Evaluating The Current Curriculum

There are times when it becomes necessary to modify the curriculum. Local procedures vary but the following process could serve as a model. A major factor in any decision is the enthusiastic support of the mathematics department. Discussions within it must clarify issues and provide data for a written proposal. From this the mathematics supervisor and/or committee within the department can proceed. Before the proposal reaches the hands of the curriculum coordinator it must be well prepared and documented. It is wise if such a proposal concern itself with such matters as:

1. The rationale for the course with emphasis on its contribution to the curriculum, instructional improvement and its effect on student growth in mathematics.
2. A course outline and objectives.
3. Personnel needed to establish the course.
4. The approximate cost of implementing the course and of maintaining the augmented mathematics curriculum.

If these matters are carefully considered in the original proposal, it is much easier to make modifications as the proposal works its way through curriculum councils, superintendents, education committees and on to its final destination, the board of school directors.

Modifications within existing programs are always taking place. These provide exciting ways for departmental personnel to work together. Usually school districts have fewer restrictions with modifying an established course than with implementing a new course. In order to reflect changes it is essential

that course guidelines be updated periodically and that modifications be reviewed with counselors and administrative personnel. Modifications also provide opportunities to publicize school activities.

C. Course Of Study Development

A course of study outline stands as a major instrument which reflects and implements the philosophy of a school and its mathematics department. When taken together, the outlines of the various mathematics courses provide the backbone of continuity for the entire mathematics curriculum.

When designing a course of study outline the following might be suggested:

1. A statement of purpose indicating for whom the course of study is intended, how it is to be used and how it relates to the overall instructional program.
2. The objectives of the course stated simply and in a manner which will enable them to be evaluated.
3. An outline of the basic course content.
4. A list of key student competencies and expected levels of achievement accompanied by procedures for assessment.
5. A series of suggested activities to help meet the objectives.
6. A list of helpful resources.
7. Suggested methods by which the objectives may be achieved and evaluated.
8. Suggested time schedule for completion of each unit.

(Many districts use a predetermined format for a course of study outline.)

D. Textbook Evaluation

The selection of a mathematics textbook is an important phase in the development of the mathematics program. While no course should be solely dependent upon a single textbook, the mathematics text provides for a sequence and continuity and it, together with the course outline, serves as a touchstone for any course that is taught by more than one teacher.

The question of textbook choice always involves another question:

who shall do the choosing? The ideal is for this to be done by a committee of teachers and chaired by the mathematics supervisor. The question of choice also involves a suitable and workable evaluation instrument. Such an instrument will by necessity vary with the specific subject area or grade level. A convenient instrument is a five point system where each of a series of evaluative questions is rated from a high (always) 5 to a low (seldom) 1. Total points can be quickly calculated. The major task is to then select the appropriate evaluative questions. Here is a list of sample questions:

1. Do the materials correlate with the objectives expressed in the course outline?
2. Are the materials sequential?
3. Are the materials appropriate for the student for which the course is designed?
4. Are the materials factually correct? (If not, cite page and error.)
5. Do the materials mesh with those in courses that precede the course and those which will follow the course?
6. Do the materials provide for review?
7. Are students encouraged to learn methods of problem solving and to think for themselves?
8. Is there a balance between skill and concept development?
9. Is the text adaptable to different types of teaching (large group, small group, individualized)?
10. Is the reading level appropriate for the student who will use the text?
11. Are sufficient activities and/or exercises included?
12. Are materials non-descriminatory in nature?
13. Are the materials up to date?
14. Does the book seem durable?

E. Evaluation And Testing

What are the responsibilities of the mathematics supervisor in the broad realm of evaluation and testing? These responsibilities would seem to fall within three specific areas.

First, there is the area of district-wide testing. What tests are mandated by the district or by the state? How are these tests related to the mathematics curriculum? What control does the supervisor have over these tests? How are these tests used? What implications do these tests have for the student's educational experiences?

Second, there is the responsibility of assisting the classroom teacher with the procedures involved in planning and writing tests. The NCTM provides several exceptional aides. The entire 26th yearbook, Evaluation in Mathematics, is devoted to this topic as is the monograph Evaluation in the Mathematics Classroom: From What and Why to How and Where by Marilyn Suydam. The November 1979 issue of "The Arithmetic Teacher" is devoted to the topic Assessing Student Learning. Many schools maintain professional libraries and some of these may have copies of several booklets published by the Educational Testing Service. Among these are: Making the Classroom Test: A Guide for Teachers, Multiple-Choice Questions: A Close Look, and Short-Cut Statistics for Teacher-Made Tests.

Third, there is the responsibility to be aware of current trends in testing which may influence the mathematics curriculum. In the fifties the practices of the Educational Testing Service greatly influenced the high school mathematics curriculum for college bound students. The current interest in "mathematical competencies" has broad implications.

A current trend in evaluation is the one exemplified by the development of testing programs by textbook publishers to coordinate with their mathematics texts at all levels. These programs are often extensive (particularly for series encompassing grades K-8), include pre and post tests for each unit, cumulative tests and often several forms of a test.

Most school districts use standardized tests. District policies vary as to how extensively the testing is done and as to what use is made of the data. (Many federally funded programs require such testing.) Most testing companies provide scoring services. Some scoring services are so sophisticated that the results can be analyzed by student, by item, by group, or by almost any criteria that one could desire. When examining, selecting, or administrating such tests the mathematics supervisor may wish to ask:

1. Why is the test being given?
2. How will the results of the test be used?
3. Does the test evaluate what is being taught?
4. How will the test help the student?
5. How will the test be used by the teacher?
6. What effect will such testing have on the mathematics program?

Many national testing programs have implications for mathematics supervisors as they work with curriculum and instructional goals. The Preliminary Scholastic Aptitude Test (PSAT), the Scholastic Aptitude Test (SAT) and the American College Test (ACT) all fall well within this category. Tests such as the Mathematics Level I, Mathematics Level II, Calculus AB and Calculus BC, all administered by the Educational Testing Service, require not only familiarity with the tests themselves but the dissemination and coordination of this knowledge with members of the mathematics department and individuals working with pupil personnel services. For more information on tests, get a copy of the NCTM publication by James Braswell, "Mathematics Tests Available in the United States".

A statewide test, the Educational Quality Assessment (EQA), administered once every three years to each school district in the state on a rotating basis is a test provided by the Pennsylvania Department of Education (PDE) which may help supervisors evaluate their mathematics programs. The report provides a school district with much information.

The supervisor may also find the need for a test to meet a specific purpose. An example of such a test would be an algebra readiness test to screen students for inclusion in an eighth grade algebra program.

One very special test should be mentioned, the National High School Mathematics Examination, given each year in March. This test provides the mathematics student with precalculus mathematical problems that are extraordinarily challenging. Information concerning the examination may be obtained from its executive director, Walter Mientka, University of Nebraska - Lincoln, 917 Oldfather Hall, Lincoln, NE 68588. (The Contest Problem Books I, II, and III containing problems from the 1950 through the 1972 examinations, are available from the NCTM.)

F. Staff Selection And Evaluation

The Role of the Supervisor

The supervisor's role is dictated by the job description under which the individual functions. The scope of the position depends upon many things such as the degree of authority the district is willing to delegate to the supervisor, the amount of time during the teaching day available to the supervisor for the supervision and planning, and the supervisor's ability to implement suggestions made to and by mathematics teachers and administrators. In many instances successful supervision is a function of the skill with which the person works with others involved in the total educational milieu, everyone from the chief school administrator to the custodians.

The person held responsible for recommending mathematics teachers for employment and their performance should carry supervisory certification in in mathematics and be subject area oriented with a strong background in mathematics. The title may be supervisor or department head or coordinator or ---, depending upon the administrative structure of the district.

Certified supervisors are usually found in larger school districts where the weight of purely administrative tasks compels the sharing of some responsibilities, one of which is the supervision of subject area teachers. The supervisor usually functions in several buildings consequently willingness on the part of the principals to share responsibilities and to cooperate with the supervisor is a prerequisite to successful supervision.

Smaller districts or those believing that a strong principal is the backbone of the educational system, will probably have department chairpersons. These people usually function in one building, sometimes carry supervisory certification and probably teach a number of classes. Persons in this position usually do not evaluate teacher performance but may, if their time permits, visit classes. They will probably be responsible for textbooks and supplies and department meetings and will serve on the district mathematics curriculum committee.

The decision of a district to support subject area supervisors who spend all or most of their time in supervision and curriculum development, coordinating all areas and interests of particular departments is dependent upon the monies

available and the priorities of the district. Making such a decision indicates that the district sets a high priority on academic excellence.

The quality of education in a school district is directly related to the caliber of the instructional staff. The selection of mathematics teachers is not the sole responsibility of the mathematics supervisor. He must work in concert with the building level administration as well as central administration. There are critical areas of selection for which the mathematics supervisor is best qualified.

When vacancies occur in the mathematics department, the supervisor must define the special competencies required of the candidates. These may include specialization in a particular branch of mathematics, talent for working with specific kinds of learners (i.e. vocational students, gifted pupils) or experience in a particular educational setting such as team teaching. Applications can them be screened with these specific criteria in mind. The supervisor should submit to the administration a list of candidates he/she deems worthy of interviewing, based upon the evaluation of the required competencies.

The interview is an opportunity to obtain as much information as possible from the prospective candidate. Careful prior planning can improve the value of the interview. Since more than one person will interview the applicants, there should be an understanding of what areas of questions each administrator will concentrate on. Because the supervisor is a mathematics specialist, he/she should be primarily concerned with assessing the candidates subject matter competence and knowledge of the mathematics curriculum appropriate to various grades and courses. In order to be able to make the comparison of candidates as objective as possible, the supervisor should plan several key questions which can be directed to all candidates.

The supervisor should keep in mind that the focus in the interview should be on the applicants' experiences. The questions asked must be general enough in that they will require the applicant to make judgements and express his ideas, yet specific enough to differentiate a "good teacher" from a "good talker". Above all, the supervisor will want to identify a candidate who will relate

well with other members of the department.

The following are some suggested questions which a mathematics supervisor may find appropriate to ask candidates for mathematics teaching positions:

1. Of the mathematics courses which you took as an undergraduate which was your favorite, and why?
2. Thinking about your previous teaching experience (as a classroom teacher or student teacher) what one lesson stands out as your very best? Describe it.
3. What is the most useful instructional aid, puzzle, or game which you have made or used? Where did you get the idea?
4. In what facets of teaching are you most in need of improvement and how can a supervisor help you?
5. Of the teachers you have previously been associated with who has influenced you most profoundly and why?
6. What would you identify as five characteristics of an outstanding teacher?

Based upon the evaluation of credentials and the responses to interview questions the supervisor should prepare a rank order of the candidates interviewed and submit it to central administration. Most school districts have a standard form for rating candidates. The supervisor should keep interview notes for future reference. It is the responsibility of the mathematics supervisor to strongly recommend the candidates of his choice; the final selection process should be a group effort, but the supervisors initial identification of required competencies should be met. The need for coaches, club advisors and other non instructional considerations sometimes influence the thinking of building level administrators. The mathematics supervisor must, to the best of his ability,see that the best available mathematics teachers are employed.

Competent supervision will mold the talents of the mathematics staff into a cohesive unit with common goals and always striving for improvement. Supervision can be reduced to rating teacher performance, the supervisor being

forced to make the assumption that teachers come, by virtue of certification, fully prepared, competent, skillful and able to perform successfully in the classroom under all circumstances. The able supervisor recognizes that this is not the case, that staff members need to realize that they do not work in a vacuum created when they close the door to the classroom, that teachers of mathematics have ideas to share, suggestions to make, and most importantly, must work as a team to insure a totally successful program. Supervisors must have more to offer than a teacher rating. The supervisor should be a sounding board for ideas the teacher wants to try, a supplier of materials and information about mathematics and new developments in the art of teaching mathematics and a source of help in any of the myriad situations that arise in the daily contact with students and their families. If the supervisee is to feel comfortable seeking help from and sharing ideas with the supervisor, he must perceive the supervisor's role as supportive to the mathematics teacher and the mathematics program. The teacher must not feel that asking for assistance will be viewed by the supervisor as a sign of weakness. Encouraging each teacher to invite you, the supervisor, to visit a specific class is sometimes helpful. The supervisee is thus able to demonstrate a technique he/she feels is effective or to offer a teaching aid he has created or to present a lesson he/she feels is especially potent.

Should the supervisor indicate a willingness to be invited to observe a particular lesson, he/she should be careful not to give the impression classes will be visited by invitation only. It is essential that the supervisor see classes being taught under routine circumstances, with daily procedures and preparations being carried out. Of course, the supervisor must recognize that any visitor causes minor shockwaves within the room; students may become very quiet, the teacher may develop stage fright, and so on. Putting the teacher at ease prior to the start of classroom observations is necessary. The supervisee, especially one new to teaching, must know that holding his/her position and maintaining his/her rating will not depend on one visit to his/her class.

In addition to the annual rating form used by the school district, some systems have developed forms to be used during classroom visitations and semester or other long-term evaluations. These may take the form of checklists, anecdotal records or a combination of both. Again, the supervisor should be knowledgeable concerning any district policies or contractual provisions governing the use of these forms such as time limits involving conferences to be held after the classroom visit or how copies of the reports are to be distributed.

It is natural that teachers may have some apprehension about being evaluated but the supervisor can minimize the tension. The supervisor must project himself/herself as an experienced classroom teacher who is well aware of the daily problems the teacher faces. The supervisor, when making a classroom visitation, can circulate about the room and give individual help to students and may even contribute to the lesson. By being realistic in assessing teacher performance and constructive in helping teachers solve problems the supervisor will establish a high level of credibility with his/her staff. The supervisor will then be viewed as an advocate and not an adversary.

H. The Newly-Appointed Teacher

Several types of teachers belong in this category--those with no prior experience and those with prior experience from another state, system, school, or grade level. All of these teachers will require assistance to acquaint them with local school considerations (See 1-B, p. 1) And, if the following recommendations are employed by the supervisor and the teacher, then their communication network will be strengthened:

1. Develop suggestions and plan options for (a) the effective use of time, materials, or instructional aids and (b) the efficient grouping of students or use of the physical setting.

2. Develop specific methods and strategies to initiate and complete particular units of study.
3. Examine and test specific suggestions for creating a constructive learning environment.
4. Provide opportunities for observing other classroom situations, for participating in workships, and for attending professional conferences.
5. Develop and use a variety of modes of observation and evaluation for instructional patterns and student achievement.
6. Share sources of materials, activities, aids, and new developments in instruction and programs.
7. Encourage the sharing and testing of ideas which are developed in the local setting with other colleagues.

Not all of these recommendations can be, nor should be, considered immediately with the newly appointed teacher. In the event that assistance is sought or observations suggest such, limiting the situation to one provides the supervisor and teacher with a target. These suggestions are not limited to the newly-appointed teacher. While the supervisor may utilize these focal points for any instructional self-improvement, other types of leadership and service may be provided to the experienced and senior teacher.

I. The Expereinced/Senior Teacher

These types of teachers have provided personnel continuity to a particular school and its mathematics instructional program. Any supervisor's unconscious negligence which assumes an apparent competency in teaching growth may result in teacher complacency and the creation of static conditions. Teaching is a constantly developing reflective activity and not a job to be learned once and for all. The supervisor must not only share new instructional research or program modification, but must also continually encourage the experienced staff member to be actively involved with instructional introspection and professional sharing.

It is important to recognize and utilize the worth of each teacher, especially the experienced teacher. Such a teacher should be encouraged to be a supervising-demonstration teacher who assists the schools' less experienced teachers through formal sharing of techniques or informal problem solving. The supervisor should encourage this teacher to share ideas, activities, techniques, and experiences through departmental workshops, in-service programs, professional conferences, and professional journal writing.

Most importantly, the supervisor should attempt to broaden the professional vision and participation of the experienced teacher and to utilize that individual's teaching experiences as a sounding board for consideration of new instructional techniques and changes in the mathematics program.

Success in supervision stems from reasonable interpretation of the concepts of authority and responsibility. The highest quality of supervisory authority comes from sincere inner strength and full competence in supervisory skills. Responsibility in supervision is essentially practicing the best that is known about teaching mathematics and collaborative problem solving. Ideal supervision respects pedagogical expertise, social discipline, and content continuity. The ideal supervisor understands the variety of factors affecting teacher performance, student learning, and program development. Supervisory action utilizes many modes of evaluation to improve both teaching and learning of all participants in schooling.

J. Sample Competencies For Chairpersons:

Self-Evaluation Checklist**

EDUCATIONAL LEADERSHIP	THIS IS IMPORTANT TO MY LEADERSHIP ROLE YES NO	I AM SATISFIED WITH MY LEVEL OF COMPETENCE AND PERFORMANCE YES NO	I AM SATISFIED WITH THE AMOUNT OF TIME I SPEND ON THIS YES NO	I NEED IN-SERVICE HELP ON THIS YES NO
1. Setting Instructional Goals Given a mandate to clarify major goals of instruction, you can lead groups of parents, citizens, specialized personnel, teachers, and pupils through a series of discussions, presentations, training sessions, and other experiences to produce a report showing some of the most important instructional goals on which there is agreement.				
2. Designing Instructional Units You can design instructional units which specify targets and objectives, instructional sequences, a variety of appropriate teaching/learning activities, materials, and evaluative procedures.				
3. Developing and Adapting Curricula Having secured innovative curricula developed outside the school or district, you can adapt the curruicula to meet the needs of a student or student group, and make them available to local personnel for use in guiding instructional planning.				

EDUCATIONAL LEADERSHIP (cont)	THIS IS IMPORTANT TO MY LEADERSHIP ROLE YES NO	I AM SATISFIED WITH THE AMOUNT OF TIME I SPEND ON THIS YES NO	I AM SATISFIED WITH MY LEVEL OF COMPETENCE AND PERFORMANCE YES NO	I NEED IN-SERVICE HELP ON THIS YES NO
4. Evaluating and Selecting Learning Materials Given expressed needs for learning materials, you can develop a set of evaluative criteria and procdures to determine the quality, utility, and availability of learning materials, and can organize and conduct review sessions where teachers and other personnel can apply the criteria to new materials and make recommendations for acquisitions in needed areas.				
5. Evaluating the Utilization of Learning Resources Given an array of learning resourses currently available for use, you can design and conduct a study to determine the extent and appropriateness of their utilization, and based on the results of that study, can make recommendations for the improved utilization of specific learning resources in specific ways.				
6. Producing Learning Materials Given learning needs and a curricular design to meet those needs, you can arrange for the production of the necessary learning materials to complement, fulfill, and/or enhance the aims of the curriculum.				
7. Supervising in a Clinical Mode Given a teacher experiencing diffidulties within a classroom, you can lead the teacher through a clinical cycle using classroom observation data, non-directive feedback techniques, and various planning and in-service expereinces to produce significantly improved teacher behavior.				

EDUCATIONAL LEADERSHIP (cont)	THIS IS IMPORTANT TO MY LEADERSHIP ROLE YES NO	I AM SATISFIED WITH THE AMOUNT OF TIME I SPEND ON THIS YES NO	I AM SATISFIED WITH MY LEVEL OF COMPETENCE AND PERFORMANCE YES NO	I NEED IN-SERVICE HELP ON THIS YES NO
8. Planning for Individual Growth Given a teacher and data concerning various facets of his/her on-the-job performance, you can assist the teacher in establishing individual professional growth plans which include objectives for change in classroom practices, a schedule of expereinces sequenced for continuous stimulation and growth, criteria specified for interim and terminal evaluation, and a specified period for accomplishing the objectives.				
SUPERVISORY LEADERSHIP				
1. Building a Healthy Climate You know and are able to employ model(s) that identify organizational conditions important to the building of self-actualization in the staff and the satisfication of ego needs of individuals.				
2. Team Building You know about and are able to employ procedures for establishing organizational goals, clarifying roles, planning and otherwise providing structure in order for individuals to relate to each other in cooperative and supporting ways.				
3. Resolving Conflict You know about and are able to work through conflict situations with students, parents, teachers and others related to school activity involving role conflict, value conflict, goal conflict, and interpersonal conflict.				

SUPERVISORY LEADERSHIP (cont)	THIS IS IMPORTANT TO MY LEADERSHIP ROLE		I AM SATISFIED WITH THE AMOUNT OF TIME I SPEND ON THIS		I AM SATISFIED WITH MY LEVEL OF COMPETENCE AND PERFORMANCE		I NEED IN-SERVICE HELP ON THIS	
	YES	NO	YES	NO	YES	NO	YES	NO
4. Making Decisions You know about and are able to apply decision-making models, and through participatory procedures, develop with the students and staff rational approaches to problem solving; focusing both on problem content and on process.								
5. Planning and Organizing Meetings You know about and are able to plan and operate meetings which are effective because they get the job done and at the same time build staff identity and commitment to group decisions.								
6. Recruiting and Selecting Personnel You know about and are able to engage in a variety of selective recruitment activities, and can secure a list of several possible applicants from various sources, can systematically secure and validate relevant information on the applicants by conducting personal interviews, by checking with previous employers, and by using other selection procedures, and can prepare a set of recommendations for filing the job requirements.								
7. Assigning Personnel. You know about and are able to analyze the needs, expectations, and composition of existing staff groups in various units, and, based on that analysis, you can prepare and justify recommendations for assigning and reassigning staff members to positions for optimum educational opportunity.								

SUPERVISORY LEADERSHIP (cont)	THIS IS IMPORTANT TO MY LEADERSHIP ROLE YES NO	I AM SATISFIED WITH THE AMOUNT OF TIME I SPEND ON THIS YES NO	I AM SATISFIED WITH MY LEVEL OF COMPETENCE AND PERFORMANCE YES NO	I NEED IN-SERVICE HELP ON THIS YES NO
8. Bringing About Change You know about and are able to build a change strategy which takes into account human factors helping or hindering change, level of acceptance needed from teachers for successful implementation and a realistic appraisal of the amount and kind of influence you have as a change facilitator.				
ORGANIZATIONAL LEADERSHIP				
1. Revising Existing Structures Having determined the strengths and weaknesses of an existing organizational structure, you can propose carefully reasoned or research-supported changes, which may include the alteration of assignments, of the use of staff time, of the required reporting patterns, or of the allocation of resources to improve efficiency, productivity, and morale, and, in so doing, improve efficiency.				
2. Assimilating Programs Given a successful instructional program operating within a department, center, classroom, or other unit, you can design a plan for the smooth intergration of the entire program or selected components therof into a larger system, prepare a time-table and assignments for the transferring of responsibilities, and assure that the instructional improvement evidenced in the program is continued in the system to which it is transferred.				

ORGANIZATIONAL LEADERSHIP (cont)	THIS IS IMPORTANT TO MY LEADERSHIP ROLE		I AM SATISFIED WITH THE AMOUNT OF TIME I SPEND ON THIS		I AM SATISFIED WITH MY LEVEL OF COMPETENCE AND PERFORMANCE		I NEED IN-SERVICE HELP ON THIS	
	YES	NO	YES	NO	YES	NO	YES	NO
3. Monitoring New Arrangements Given the task of implementing a new organizational arrangement, you can determine reporting procedures compare actual operations with planned developments, and when necessary, make recommendations to modify operations to bring them into agreement with formulated plans.								
4. Developing a Staffing Plan Given a new project proposal which specifies budget, general objectives, and operational procedures, you can develop job descriptions for each, and specify the competencies required of the individuals who will fill the positions.								
5. Informing the Public You can establish, promote and maintain favorable impressions of public school programs among community members by disseminating school information through the public media, by speaking to public and school groups, by conferring with parents and other interested individuals and by meeting, as necessary, with community groups and leaders.								
6. Student Discipline You can establish adequate control of the student body and provide necessary disciplinary rules with the help and cooperation of teachers, parents and students.								
7. Policies and Procedures You know about and are able to establish a system of policies and procedures, linked to and justified by educational goals and purposes, which facilitates and frees teachers to work more effectively and which								

ORGANIZATIONAL LEADERSHIP (cont)	THIS IS IMPORTANT TO MY LEADERSHIP ROLE YES	NO	I AM SATISFIED WITH THE AMOUNT OF TIME I SPEND ON THIS YES	NO	I AM SATISFIED WITH MY LEVEL OF COMPETENCE AND PERFORMANCE YES	NO	I NEED IN-SERVICE HELP ON THIS YES	NO
sets high standards for that work.								
ADMINISTRATIVE LEADERSHIP								
1. You know about and are able to employ managerial planning tools and procedures in administering your department.								
2. You can organize, supervise, and manage the financial affairs of the department.								
3. You are familiar with the projected budgetary needs of your school, including salary, operation and maintenance costs.								
4. You know the financial situation of your school and can analyze cost by student, grade, by total enrollment by number graduating, and by number failed or dropping out. You are aware of implications for your department.								
5. You can plan the department's educational program in accordance with the available facilities and equipment.								
6. You can apply rational decision making models and procedures in the administration of department programs.								
7. You are able to keep accurate records of purchasing needs, inventories, expenditures and other business functions.								

** Ben Harris and John King, Professional Supervisory Competencies, Competency Specifications for Instructional Leadership Personnel. Special Education Supervisor Training Program University of Texas at Austin, Rev., 1975, and LLoyd McCleary and Kenneth McIntyre, "Competency Development and University Methodology", The Principal's Search. Washington, DC: National Association of Secondary School Principals, 1972, pp 53-68

K. Department Effectiveness Inventory

Department Inventory*

I. Does the Department Have An Innovative Climate?

YES	NO	
____	____	1. Do department members feel that trying out new approaches, materials, and techniques is the "thing to do"?
____	____	2. Do department meetings focus largely on substantive issues?
____	____	3. Do most teachers in the department borrow and share ideas for the classroom during the semester?
____	____	4. Do teachers talk about their teaching areas when they get together informally at school?
____	____	5. Do most department members know what their colleagues are doing?
____	____	6. Do teachers sit in on each other's classes?
____	____	7. Is the department open to student input about course offerings and teaching methods?
____	____	8. Nearly all of the teachers in the department would agree with my assessment.
____	____	9. My principal would agree with my assessment.

II. Are Department Members Skilled At Solving Problems Together?

YES	NO	
____	____	1. Is the department sensitive to needs for change, so that important desisions are made carefully and problems are considered before a crisis is present?
____	____	2. Is a lot accomplished when the department meets?
____	____	3. Does the group face important issues?
____	____	4. Does the department generate a variety of solutions before narrowing consideration to one or two?
____	____	5. Do all members of the group make important contributions?
____	____	6. When conflicts arise, are they resolved by testing the suggestions, looking for evidence, seeking more information?
____	____	7. Is there a systematic procedure for tackling problems and tasks?

____ ____ 8. Do department members frequently solve problems or accomplish goals by working with colleagues?

____ ____ 9. Nearly all of the teachers in the department would agree with my assessment.

____ ____ 10. My principal would agree with my assessment.

III. Is The Department Part Of An Information Network?

YES NO

____ ____ 1. Are department members active in teaching-area professional organizations?

____ ____ 2. Does the department receive professional journals and newsletters?

____ ____ 3. Does the department have a plan for seeing that newsletters. journals or other sources of new imput get to members for whom they might be relevant?

____ ____ 4. Does the department have easy access to a resource center of materials for classroom use?

____ ____ 5. Are teachers in the department in contact with their teaching-area counterparts in other schools?

____ ____ 6. Do members attend workshops, conventions, and other opportunities for professional growth?

____ ____ 7. Does the department have a professional library in the building?

____ ____ 8. Are there resource personnel available who can track down articles and materials relevant to projects undertaken by the department?

____ ____ 9. Does the department receive news of opportunities and information about teaching materials from a district coordinator or supervisor?

____ ____ 10. Nearly all of the teachers in the department would agree with my assessment.

____ ____ 11. My principal would agree with my assessment.

IV. Does the School Structure Support Innovative Teaching?

A. Does the department make major decisions about its program?

YES NO

____ ____ 1. Does the department have a budget of its own?

___ ___ 2. Does the department contribute significantly to decisions involving major reorganization or curriculum change?

___ ___ 3. Does the department choose the materials used in its classrooms?

___ ___ 4. Does the department plan course offerings?

___ ___ 5. Does the department determine or influence the nature of in-service day activites?

___ ___ 6. Does the department have a voice in selection of a department head?

___ ___ 7. Does the department take an active part in interviewing and hiring new members?

B. Does the department have resources for working together?

YES NO

___ ___ 1. Does the department have a place to work together?

___ ___ 2. Is time allotted for frequent department meetings?

___ ___ 3. Do department members (at least those teaching the same subject) have a simultaneous free period?

___ ___ 4. Is time provided for in-service days or other continuing education?

___ ___ 5. Does the department head have extra time and other support for carrying out his duties?

___ ___ 6. Are secretarial help and adequate duplication equipment provided for teachers producing supplementary materials?

___ ___ 7. Does the system provide financial support and/or release time to teachers who wish to attend professional conferences or to visit other schools?

___ ___ 8. Can department members order supplementary materials for the classroom or library?

___ ___ 9. Does the library provide a good collection of teaching area resources for students?

___ ___ 10. Does the building design provide instructional flexibility?

___ ___ 11. Are there facilities for conferring with students individually?

C. Are the school and district climate supportive?

YES NO

___ ___ 1. Do the principal and staff clearly support innovation?

___ ___ 2. Is the supervisor's office a useful source of ideas and information?

___ ___ 3. Does the local press usually respond positively to developments in the schools?

___ ___ 4. Do teachers feel that the community is proud of its schools?

___ ___ 5. Does the school inform parents about innovations and activities?

___ ___ 6. Nearly all of the teachers in the department would agree with my assessment.

___ ___ 7. My principal would agree with my assessment.

Scorecard:

Below 28	You have your work cut out for you.
29-39	You are making progress.
40-49	Your department has the climate needed for effective functioning.
Over 49	Your department is a bell-ringer.

* Prepared by National Council of Supervisors of Social Studies.

CHAPTER V

The Supervisor And In-Service Education

A. Introduction

One of the major responsibilities of supervisors of mathematics is to provide in-service education opportunities for the teachers under their direction. This is a challenging responsibility and one that, if done with proper planning and enthusiasm, will contribute significantly to the effectiveness of the mathematics supervisor. If the in-service programs are well planned and organized, the teachers will look favorably upon participating in them.

The term " in-service education" will be used to identify any type of organized experience designed for mathematics teachers to broaden their understanding of mathematics, their students, and the way students learn mathematics, and to help teachers discover better ways to teach mathematics to students.

NCTM's An Agenda for Action[1] lists eight recommendations for mathematics instruction as we go into the 1980's. Two of these recommendations - that we apply "stringent standards of both effectiveness and efficiency" to mathematics teaching, and that "mathematics teachers demand of themselves and their colleagues a high level of professionalism" can be supported through well planned in-service staff development programs.

In the 1975 NACOME[2] report 61% of teachers surveyed felt that "in-service education has not fit classroom needs...". With an effective in-service staff development program, improved teaching should lead to improved learning and higher levels of student performance. "Maintaining and improving competency of teachers is perhaps the most important factor in achieving better education in the schools."[3] (An In-service Handbook for Mathematics Education NCTM, 1977, Alan Osborne, ed.)

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[1] An Agenda for Action (Reston: National Council of Teachers of Mathematics, 1980) page 1

[2] NACOME Report-Overview and Analysis of School Mathematics Grades K-12 (Washington: Conference Board of the Mathematical Sciences, 1975) page 92

[3] Alan Osborne, ed., An Inservice Handbook for Mathematics Education (Reston: National Council of Teachers of Mathematics, 1977) page 3

B. Types of In-Service Education Programs

1. Meetings Held at the End of the School Day. Mathematics supervisors often schedule department meetings at the end of the school day. Frequently, the district provides for such meetings by shortening the school day to allow more time for these meetings. Although such meetings are relatively easy to arrange, a major disadvantage of holding meetings after school is that often the teachers are too tired, following a day of teaching, to give their best thinking -- to give their "all"-- to what is being discussed. Furthermore, since mathematics teachers are frequently involved in other school activities after school (sports, clubs, etc.), some are unable to attend the in-service meetings and therefore, lose touch with what the rest of the department is doing. After school meetings are, however, often necessary to handle routine items. Such meetings can be worthwhile, especially if school is dismissed early with priority given to in-service meetings over other activities.

2. Full Day (or Half-Day) Meetings. Another arrangement is the day-long (or half-day) in-service program. Such programs provide teachers opportunities for immediate implementation of ideas. Compared to the after-school meetings, the all-day in-service programs offer several advantages.

a. The teachers enter into the program "fresh" -- they are not exhausted from a full day's teaching, and they devote better thinking to the in-service program.

b. The teachers see the in-service program as their purpose for being at work that day, not as a responsibility added to their work day, and, as a result, look more favorable upon participation in the program.

c. Since more time is available, the teachers are able to become more involved in the program, and a smaller proportion of time is devoted to routine matters.

d. The longer in-sevice programs provide opportunities for teachers to participate in different activities and for the mathematics supervisor to invite experts from outside the school district to the meeting to discuss topics of value to mathematics teachers. Frequently, the in-service programs involve hands-on experiences for the teachers, as more time is needed for this type of activity.

Proper planning by the mathematics supervisor for an all-day (or half-day) in-service program is an absolute must, and many teachers should be involved in planning the program. It is often wise to schedule the "heavier" (those requiring the most constructive and critical thinking) activities earlier in the day, when the teachers are "fresher".

3. Summer Curriculum Planning Workshops. Many school districts allocate money in their annual budgets for professional workshops during the summer months. Groups of mathematics teachers, under the direction of the mathematics supervisor, work as teams to develop the curriculum for use during the following school term. Conducting workshops during the summer offers several advantages.

a. The teachers start off each day "fresh", with the energy needed to do constructive thinking. Since the work day is frequently shorter and less demanding than the usual school day, the teachers seldom reach the time when they are too tired to do good work.

b. The teachers in the workshop programs are volunteers and are receiving additional compensation for their work. As a result, they are more enthusiastic and interested in the success of the programs.

c. The teachers can devote their full professional thinking to the curriculum work during the entire duration of the workshops since they are not faced with the usual demands of teaching.

d. College students and others seeking summer employment are available to assist in the curriculum development programs. These support personnel can be assigned important tasks that do not require the professional expertise of the mathematics teacher.

e. In some cases, ideas being developed in the summer programs can be field-tested immediately with students attending summer school.

Summer in-service programs that are well-organized and designed to accomplish definite goals can be successful in helping school districts modify and up-date their mathematics programs. For those districts which recognize the need for major modifications in their programs, the summer in-service program is one of the most efficient ways to accomplish these revisions.

A portion of the time allocation for summer workshops should be set aside for teachers to become familiar with new programs. These teachers would have an opportunity to review any new materials and discuss the programs with each other and with the mathematics supervisor.

The mathematics supervisor must secure the needed personnel, supplies, and equipment. Objectives must be clearly established and understood by those working in the program. The supervisor must give direction to the workshop program, always being ready with helpful suggestions and assistance. It is important that the mathematics supervisor convince the school board that the money requested for summer in-service workshops is necessary to improve the district's mathematics program.

4. Professional Meetings. The mathematics supervisor should encourage teachers to attend meetings of such professional organizations as the national and state mathematics councils, and their local affiliates. The session speakers and workshop leaders in these meetings are often from colleges and school districts in which new ideas are being tested and they are knowledgeable about current developments in the field of mathematics education.

Since most school districts recognize the value of having teachers participate in professional meetings, they pay the teachers' salaries and expenses to attend them. To encourage teachers' participation in professional meetings held in the evening or on Saturday, a few districts include professional in-service days in the teachers' contract and count attendance at such meetings towards fulfilling the in-service days requirement of the contract.

5. Teacher Visitations. In order to become more familiar with things happening beyond the four walls of their calssrooms, teachers should be encouraged to visit other schools and establishments where mathematics is used. The mathematics supervisor should be alert to new programs, ideas, and changes taking place and should encourage those teaching mathematics to investigate those that might suggest changes needed in the district's mathematics program.

6. Classroom Demonstrations. The mathematics supervisor is a "master teacher" and should make frequent classroom demonstrations to show the teachers new and different approaches. The demonstration lesson can be used to bring

to the staff ideas that the supervisor has gained by visiting other schools and attending conferences.

7. Individual Conferences. The mathematics supervisor, must have a good working relationship with teachers and be able to confer freely about the mathematics program and its implementation. Teachers must feel that the supervisor geniunely desires to help them and is able to do so.

8. Maintaining a Professional Library and a Teacher Resource Center. A professional library and a teachers resource center should be made readily accessible to every teacher of mathematics. The professional library should contain the most current material related to the teaching of mathematics, including the journals, yearbooks, and other publications of such professional organizations as the NCTM, the PCTM, and their local affiliates, as well as current textbooks and information form publishers. The teacher resource center should contain supplies and equipment that teachers need to make materials for classroom use. Models, games, puzzles, and bulletin board displays are some items that can be constructed in a teacher resource center. It is the responsibility of the mathematics supervisor to see that these rooms are conveniently located and properly equiped.

9. College Courses. Teachers -- especially beginning teachers -- receive a great deal of in-service education by studying in college-level and graduate-level courses. The State recognizes the value of this type of in-service education by stipulating completion of such courses as a requirement to receive a permanent teaching certificate. School districts further encourage teachers to study additional courses by increasing salaries for those who earn additional credits and/or degrees, and, in many cases, by paying all or part of the tuition. In addition, some districts make arrangements for college courses to be taught in their schools so that the district's teachers can get advanced training without traveling to the college campus. Also, many Intermediate Units provide courses that are acceptable for certification and/or advances in salary.

Mathematics supervisors should be familiar with programs offered in nearby colleges, universities, and the Intermediate Unit so that they can encourage and advise teachers to take courses that would be of value. If the mathematics supervisor can interest enough teachers in a particular course then a nearby college or the Intermediate Unit should be contacted to arrange to have this course offered in a school in the district.

10. Supervising Student Teachers. The mathematics supervisor should encourage schools of education to have their students receive student teaching experiences in the local district. The supervisor must select teachers who are most qualified to be cooperating teachers and must monitor progress of student teachers to insure the effectiveness of the student teaching program.

When a district has student teachers, it benefits by having them bring into the district new ideas and different approaches. The district gains in another important way: when it is necessary for the district to hire a mathematics teacher, the mathematics supervisor will have had the opportunity to observe these student teachers and will be able to evaluate their qualifications for the position.

In summary, supervisors of mathematics must develop positive relationships with teachers and exercise leadership in providing in-service education programs which teachers will recognize as necessary and worthwhile endeavors. Above all else, the supervisor must devote much effort to planning with teachers for these activities.

C. Sources Of Information

The professional organizations at the national, state and local levels are a major source of information for supervisors. Following is a list of professional organizations and the names of the presidents as of January, 1981.

National Council of Teachers of Mathematics (NCTM)
President: Max Sobel (address of NCTM)

National Council of Supervisors of Mathematics (NCSM)
President: Shirley Frye

Pennsylvania Council of Teachers of Mathematics (PCTM)
President: Marlin Hartmen, Indiana University of Pennsylvania

Association of Teachers of Mathematics of Philadelphia and Vicinity (ATMOPAV)
President: Albert H. Mauthe, Norristown Area School District

Bucks County Council of Teachers of Mathematics (BCCTM)
President: Lenora De Bernardo, Levittown

Eastern Pennsylvania Council of Teachers of Mathematics (EPCTM)
President: Ned Schillow, Lehigh County Community College

Luzerne County Council of Teachers of Mathematics (LCCTM)
President: John Gregorowicz, Nanticoke

Mathematics Council of Western Pennsylvania (MCWP)
President: Roger Sullenberger, Hempfield Area High School

Association for Supervision and Curriculum Development (ASCD)

Pennsylvania Association for Supervision and Curriculum Development (PASCD)

In addition to professional organizations, supervisors should be aware of the following organizations and agencies for ideas and names of resource people to conduct in-service programs. Names and addresses are listed where appropriate and available.

Pennsylvania Department of Education
Mathematics Education Adviser - Dr. Doris Cresswell
Bureau of Curriculum Services
Department of Education
Box 911
Harrisburg, PA 17126

Pennsylvania Retrieval of Information of Mathematics Education Systems (PRIMES)
Dr. Emanuel Berger
Payne-Shoemaker Building
Research and Information Services for Education (RISE)
Harrisburg, PA

Educational Research Information Clearinghouse (ERIC)
Ohio State University
Columbus, Ohio

National Institute of Education (NIE)
Washington, DC 20550

National Science Foundation (NSF)
Washington, DC 20550

There are many other resources available to help supervisors in planning and implementing in-service programs. Local colleges and universities can provide both human and material resources. In some areas of the state there are teacher resource centers that provide training in the production of materials for teaching mathematics.

Commercial publishers' representatives are helpful in identifying and providing speakers and workshop leaders for in-service programs. They will also provide consultant services to districts selecting their program. There are many industries throughout the Commonwealth that provide resources for in-service training. Often they have a public relations person who provides resource materials, speakers, consultants or guided tours through their buildings.

The names and ideas suggested above should aid in providing meaningful in-service programs.

D. Guidelines For Inservice Education

1. Planning (Pre and Post). Planning an in-service program is a joint effort of staff and administration. Communications with teachers, informally or by needs assessments, are essential in planning successful in-service courses. Administrators need to be involved in the planning to help set goals, justify budgets to school boards, assist in the identification of resources, and assess the evaluation of the program. The supervisor is often the organizer, the expediter, and the facilitator.

Planning in-service programs is an on-going process. A supervisor should be sure that the goals of an in-service program are appropriate and feasible. For instance, familiarizing a junior high school mathematics staff with BASIC is a futile exercise in a one-hour staff meeting, but has great potential for a ten-week, 10-30 hour in-service program. A department meeting however, can be used to demonstrate to teachers the advantages of computer-assisted instruction.

Many school districts establish schedules by spring for the following year so that the supervisor can determine the available time for in-service work and plan accordingly. The sooner an in-service program is scheduled and arrangements are completed, the more likely it is that the program will be successful. Responsibilities of the supervisor include the following:

1. securing a date, time, place
2. selecting an appropriate topic
3. arranging the schedule and selecting leaders for the program
4. securing necessary materials
5. communicating information needed by participants several weeks in advance of the program with a copy of this information sent to administrators
6. preparing the necessary materials for the program's evaluation

When the in-service program has concluded, it is important to follow-up on the evaluation and to write brief thank you notes to those people who assisted in making the program possible. Where appropriate, copies of these letters should be sent to their superiors.

2. Communicating with Administrators. Mathematics supervisors should facilitate the goals of the school district and the needs of their teaching staffs by providing information and services to each. They have a responsibility to inform those preparing the budget of the districts' needs in terms of mathematics in-service programs.

When explaining plans for an in-service program to administrators, the supervisor should submit a written proposal which should include the title of topic of the program, its goals, projected time of operation with tenative dates, location, target population, leadership, materials, evaluate measures, projected budget, and time required to arrange the program.

Once a program is approved, on-going communications should refer to the original proposal. The origainal proposal and additional information should be filed by the supervisor for use in subsequent years if the program is to be continued.

3. Securing Funds. Funding considerations begin with the necessity to supply time for an in-service program. If a program is scheduled for released-time, then it is the school district which is, in effect, paying the participants. For programs run on after school time, Saturdays, or during the summer, several funding sources may be available.

1. Budgetary allocations from the school district.
2. Federal funds secured through Title Programs.
3. Grants, usually in conjunction with a proposed study by faculty at a nearby college, from National Science Foundation (NSF) or the National Institute of Education(NIE).
4. Teacher-center programs, usually Federally funded.
5. Arrangements with book companies or suppliers of instructional aides, usually in conjunction with a school or district purchase of their products.
6. National Council of Teachers of Mathematics grant.

While the above mentioned sources may pay for facilities, participants, and materials, there are additional funding possibilities for materials:

1. Samples or overruns from publishers or companies. Materials would receive wide exposure and the suppliers could anticipate additional orders.
2. Home and School Associations.
3. Surplus supplies from industry and business.

4. Using District Curricular Resources. In-service programs planned by mathematics supervisors need not be limited to mathematical content and can be presented by other resource personnel trained in such areas as media, technology, bi-lingual education, special education, and gifted education. Teachers of mathematics will benefit from well-planned programs which address not only the content areas, but also the interdisciplinary implications.

Special education teachers can present programs on: diagnosis and remediation, characteristics of special education students, and general information on trends, research, and legal mandates as they related to special education students. Media specialists can provide teachers of mathematics with skills in using audio visual equipment to improve mathematics instruction. In-service programs can help teachers become aware of the needs of bi-lingual students by providing insights into other cultures and methods of communicating with parents who do not speak English. Interdisciplinary programs can relate mathematics to art, music, social studies, science, and language arts.

It is important that guest-lecturers know their subjects thoroughly and are effective and informative. Mathematics supervisors should familiarize guest-lecturers with the goals of the programs and the expectations of the participants.

A printed handout is an important part of a successful program. The supervisor should suggest that a handout be provided and offer to assist in the printing of the handout since the lecturer may not have access to the necessary resources.

5. Devising Strategies.

1. Format. The format of an in-service program may include

lectures, "hands on" workshops, peer sharing and working one-to-one. The supervisor should determine the most effective format to achieve the goals of the program by considering the type of program, target population, duration, location and funding.

In a lecture format, participants should be comfortable and be able to take notes and see the demonstration clearly. A "hands-on" workshop format requires adequate space for use of the materials and a group size that enables the leader to work effectively with all participants. In peer sharing where members of the group act as leaders, advance notice should be given to participants stating the topic(s) to be shared, and the time allocated for each presentation. The one-to-one format involving the supervisor and teacher may take the form of conferences, demonstration lessons, team teaching, or exchange of materials.

2. Content. In the NACOME report, teachers indicated that there is a need for in-service programs which relate in both content and methology to situations they presently experience in their classrooms[4]. Supervisors should be aware of this when planning in-service programs.

Content programs can relate to such areas of mathematics as mental arithmetic, concepts of number theory, geometry, measurement, data collection and analysis, basic computation and use of calculators and computers. Methodology programs can deal with discovery learning, mastery learning, independent learning, individualized learning, teacher-directed learning, evaluation and diagnosis, and use of media and other resources.

3. Types of Programs. In planning in-service programs, supervisors should consider the advantages and disagvantages of the different types of in-service programs indicated earlier in this chapter.

4. Materials. Teachers surveyed in the NACOME[5] report (pg. 91) indicated they needed in-service programs on the development and uses of learning materials. It is important that the mathematics supervisor when planning an in-service program select materials which are most suitable for the participants in relation to the goals of the program and their continued use in individual classrooms.

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[4] opcit

[5] ibid

It is just as frustrating to teachers as it is to students to have insufficient time to develop a concept with interesting materials. If the teachers do not see the conceptual development, then they will not feel sufficiently comfortable with the materials to use them alone in the classroom. If, on the other hand, at the conclusion of an in-service program the teachers are able to return to their classrooms and use the new materials, then most likely they will feel that the in-service has been successful.

6. Evaluation. In NCTM's An Agenda for Action[6], there is an extensive discussion of the necessity for comprehensive evaluation of mathematics programs and student learning. Supervisors conducting in-service programs should assess them for effectiveness, impact on student learning and teacher performance, and quality of materials. The evaluation process for the in-service course should be presented to the participants as part of the overall plan. In-service programs should provide teachers of mathematics with both knowledge about, and skill in, evaluation.

Evaluation should be a planned part of an in-service program. The evaluations should be directed to the effectiveness of the instructors, materials, program format, allocation of time, and usefulness to themselves and their students. The evaluation form should provide a place for the teacher to indicate the need for additional programs or individual visits or conferences.

In-service evaluations should be shared with the administration to assist them in planning and funding future in-service programs.

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[6] opcit

APPENDIX I

Responses To PCSM Survey
(January 1980)

450 Survey Sheets Distributed to Public Schools in Pennsylvania.

RETURNS:

Supervisors - K-12	46
Department Heads (9-12, 7-12)	137
Supervisors, Elem. or Middle Schools	17
Administrators (Ass't Supt., Curriculum Coord.)	60
TOTAL	260

RESPONSES FROM MATHEMATICS SUPERVISORS K - 12

1. Number of pupils in your school district? range 1500 to 250,000.
2. Number of schools in your district range 4 to 280.
3. Scope of position (i.e., K-12, 5-12, 9-12) K-12.
4. What part of your day, if any, is assigned to teaching?

All	½ or more	Less than ½	None
4%	26%	33%	37%

5. What levels do you teach? Varies, mostly senior high.

	YES	NO
6. Does your job include employment during the summer?	47%	53%
7. Do you hold, or are you eligible for a Mathematics Supervisor Certificate?	76%	24%
8. Are you a member of the teachers' bargaining unit?	39%	61%

1. Are you a member of NCTM?	79%	21%
2. Are you a member of PCTM?	72%	28%
3. Are you a member of PCSM?	42%	58%

Responses from Mathematics Supervisors

	Considerable Involvement	Little Involvement
1. Curriculum development - determines courses, sequence, developing courses of study.	98%	2%
2. Instructional organization - teacher assignment, grouping or leveling students.	55%	45%
3. Staff selection - screening, interviewing orienting new teachers.	70%	30%
4. Selections of materials and facilities - developing specifications for equipment, selection of textbooks, and supplementary materials.	70%	30%
5. Budget development - preparing and submitting annual budget for mathematic books, supplies.	77%	23%
6. Special Education Programs - development of programs for gifted and remedial special education students.	58%	42%
7. Inservice Education - arranging and conducting in-service programs for teachers.	73%	27%
8. Community Education - speak to school and community groups, recommend adult education courses.	26%	74%
9. Teacher Evaluation - observation and rating of mathematic teachers	56%	44%
10. Program Evaluation - responsibility for district mathematics testing programs, evaluation of results.	64%	36%

11.	Special programs and grants - develop proposals for ESEA Title Funding	32%	68%
12.	Resource Activities - teach demonstration classes, provide model lesson plan and resource ideas for teachers.	42%	58%

RESPONSES FROM MATHEMATICS DEPARTMENT HEADS (7 - 12, 9 - 12)

1. Number of pupils in your school district range 1500 to 250,000
2. Number of schools in your district range 4 to 280.
3. Scope of position (i.e., K-12, 5-12, 9-12) 7-12, 9-12, 10-12.

4. What part of your day, if any, involves teaching?	All	½ or more	less than ½	None
	37%	49%	9%	5%

5. What level do you teach? Mostly high school.

		YES	NO
6.	Does your job include employment during the summer?	10%	90%
7.	Do you hold, or are you eligible for a Mathematics Supervisor Certificate?	37%	63%
8.	Are you a member of the teachers' bargaining unit?	74%	26%

1.	Are you a member of NCTM?	59%	41%
2.	Are you a member of PCTM?	42%	58%
3.	Are you a member of PCSM?	16%	84%

		Considerable Involvement	Little Involvement
1.	Curriculum development - determining courses, sequence, developing courses of study	90%	10%
2.	Instructional organization - teacher assignment, grouping or leveling students	48%	52%
3.	Staff Selection - screening, interviewing, orienting new teachers	38%	62%

4.	Selections of materials and facilities - developing specifications for equipment, selection of textbooks, and supplementary materials	95%	5%
5.	Budget Development - preparing and submitting annual budget for mathematics books, supplies	78%	22%
6.	Special Education Programs - development of programs for gifted and remedial special education students	29%	71%
7.	Inservice Education - arranging and conducting inservice programs for teachers	34%	66%
8.	Community Education - speak to school and community groups, recommend adult education courses	4%	96%
9.	Teacher Evaluation - observation and rating of mathematic teachers	21%	79%
10.	Program Evaluation - responsibility for district mathematics testing programs - evaluation of results	22%	78%
11.	Special programs and grants - develop proposals for ESEA Title Funding	6%	94%
12.	Resources Activities - Teach demonstration classes, provide model lesson plan and resource ideas for teachers	12%	88%

APPENDIX II: PDE Curriculum Requirements K-12

Curriculum Regulations
Required Offerings
Graduation Requirements

Supervisors may obtain a booklet containing all the information mentioned above by writing to:

PDE
333 Market Street
Harrisburg, PA 19126

APPENDIX III: Certification Policies, Procedures and Standards

INTRODUCTION

Across the nation innovations in the preparation and certification of professional personnel for elementary and secondary schools have been undertaken by state education agencies, colleges and universities. Since 1963, the Pennsylvania Department of Education has been engaged in a cooperative effort with preparing institutions and practicing professionals to establish the program approval approach to teacher preparation and teacher certification. Our continuing efforts have been profitable.

Program approval processes have encouraged innovations and have significantly improved the overall quality of preparation programs. During this same period, the Division of Teacher Education has introduced the concept of competency-based teacher education, which has helped teacher preparation institutions sharpen objectives and yet maintain their separate philosophies and identities. I believe program approval has been helpful in improving pre-service education programs in that it requires institutions to carefully examine what they do, how they do it, and why they do it.

This publication represents the continued cooperative efforts of all parties concerned with the development of quality certification programs. It is the synthesis of the efforts of personnel of the Bureau of Academic Programs, the Bureau of Teacher Certification, the various bureaus of the Office of Basic Education, the Professional Standards and Practices Commission and the various advisory bodies that have an interest in the preparation of professional educators. This is a living document in that it is under continuous review and changes are made when conditions warrant. Suggestions and recommendations for improvement of this publication will be considered for inclusion in future revisions.

Caryl M. Kline

Caryl M. Kline
Secretary of Education

PREFACE

The standards, policies and procedures for implementing the approved program approach to the certification of professional school personnel in the Commonwealth of Pennsylvania are presented in this publication. The approved program approach was recommended by the Advisory Committee on Teacher Education to the State Council of Education on July 1, 1957. The procedure for approving programs was begun during the 1962-63 school year and has been refined and improved during the ensuing years. The adoption of Pennsylvania Code, Title 22, Chapter 49 - Certification of Professional Personnel reinforced the approved program approach effective July 1, 1969.

The standards, policies and procedures have been formulated under the direction of the Secretary of Education and the State Board of Education in accordance with statutory provisions. These statutory provisions empower the Secretary of Education, on behalf of the State Board of Education, to establish and promulgate the standards of preliminary and professional education and training for professional personnel in the public schools.

The Pennsylvania Department of Education investigates and determines the acceptability of colleges, universities and other institutions of learning which wish to offer programs leading to credentials, diplomas or degrees that permit the holder at act as a professional employe in the schools of Pennsylvania. The PDE also approves such colleges, universities and institutions of learning as are deemed by it to be acceptable, and withdraws its approval of institutions which fail to maintain the required standards. A registry of approved programs in the respective institutions is published periodically.

The standards for the undergraduate and graduate programs of certification conform in substance to the Proposed Standards for State Approval of Teacher Education, National Association of State Directors of Teacher Education and Certification, United States Office of Education, Circular 351, (Revised), 1966. Pennsylvania accepts these general standards; however, a statewide study has reviewed and refined the standards applicable for each area of certification. When NASDTEC standards did not exist for positions certificated by the Commonwealth, appropriate Pennsylvania standards were developed.

OBJECTIVES AND PROCEDURES OF PROGRAM APPROVAL

Program approval is the systematic effort initiated by the Pennsylvania Department of Education during the year 1962-63 to improve teacher education programs throughout the Commonwealth. The procedures of program approval permit professionals from appropriate and specialized areas to make determinations concerning the standards for approving programs, the unique practices in preparing professional personnel and the quality of preparation programs. This allows for flexibility, creativity and innovation without eroding the standards of quality for the education of professional personnel.

Following an on-site evaluation visit to an institution, those programs identified by the visiting team as being of high quality are granted program approval status. Conditions are set and recommendations are made for programs which do not qualify for approval. It is only when these conditions and recommendations are implemented that approval is granted. The net effect is to bring about desirable changes in teacher preparation. Instead of evaluating transcripts, teams of professionals make observations, decisions and recommendations. Graduates of these approved programs enter the profession with the approval and endorsement of representative members of the profession.

Program approval is an improvement over transcript analysis because it is organic rather than mechanical in its approach to certification. Whereas transcript analysis merely assesses quantity, program approval determines the quality of the total program that leads to a particular teaching certificate, including student personnel, general education, professional education, specialized education and student teaching. Each of these programs is explored in depth as it relates to objectives, organization and administration, faculty, curriculum, resources and student achievement. Transcript analysis cannot possibly consider all of these elements.

The program approval visits provide opportunities for valuable in-service education to the professionals who are directly or indirectly involved in teacher education. The experience of visiting a teacher preparing institution, analyzing all elements of its teacher education programs and exchanging ideas with other educators, is of great value to members of the visiting team, to the personnel at the institution preparing for the evaluation and to the institutions from which the visiting team members come. As a result of the visits to teacher preparing institutions in Pennsylvania, of the ensuing reports and of the following visits by Pennsylvania Department of Education personnel, many constructive changes have been made in curricula, faculty, facilities and relationships among the academic and professional personnel in the colleges. Many of the valuable outcomes of the visits are by-products and have never been measured or evaluated.

Under the program approval approach to teacher certification, a graduate of an approved program whom the college recommends as having successfully demonstrated competency in the area of certification will be issued a certificate by the Secretary of Education.

PART II

PROGRAM APPROVAL STANDARDS
UNDERGRADUATE AND GRADUATE PROGRAMS

The following section, labeled Part II-General Standards, is applicable to all programs designed to prepare professional personnel who will be recommended for certificates and letters of eligibility to practice in the basic schools. There are Specific Standards for each certification area as well (i.e., teacher of Social Studies, School Psychologist, Secondary School Principal, superintendent's letter of eligibility, etc.). Each program evaluated by the Pennsylvania Department of Education must satisfy both the General Standards and the Specific Standards in order to receive the endorsement of the Secretary of Education as an approved program.

A. GENERAL STANDARDS

STANDARD I	The institution shall present evidence that it has a commitment to programs for the preparation of professional school personnel, including clearly designated responsibilities for long-range planning, developing, administering and evaluating of such programs. These programs shall reflect active participation from all involved departments and divisions of the institutions.
STANDARD II	The institution's philosophy shall be reflected in the general education component. This philosophy shall be compatible with and supportive of the professional preparation program.
STANDARD III	The institution's faculty shall be of sufficient number with appropriate experience and academic preparation for each specific area of certification. The appropriate faculty shall have the institution's support for continuing professional development including experiences <u>in situ</u> designed to keep the faculty informed of the perspectives of basic education.
STANDARD IV	The institution shall have and use appropriate facilities, equipment and materials for each certification program.
STANDARD V	The institution shall publish and implement policies, procedures and criteria for student admission to, retention in and completion of programs leading to certification.

STANDARD VI The institution shall:

a. publish its goals for the preparation of professional school personnel.

b. publish a statement of the role and role competencies for each certification program for which it has or seeks approval.

c. implement a program of studies and experiences which enables students to acquire the published role competencies.

STANDARD VII The institution's certification programs shall reflect:

a. studies and experiences which are relevant to current school curricula, services and practices.

b. evaluation procedures which assess the acquisition of role competencies by certification candidates.

c. program development and evaluation procedures which are accomplished through the collaboration of certification candidates, institution staff and professional school personnel, and may include recommendations of learned societies and professional associations.

STANDARD VIII Among those role competencies published by the institution, the following shall be included and shall be appropriate to the area of certification. Each certification candidate shall demonstrate the ability to:

a. apply theory and research concerning the development, behavior and learning of children including those with exceptional characteristics and/or special needs.

b. prepare, select and use materials and media; modify commercial materials; and produce original materials.

c. use appropriate methods to carry out his/her role.

d. prepare, select and use evaluation procedures.

e. apply knowledge, techniques and skills of describing and analyzing professional, institutional and political situations in order to make educational decisions.

f. assess and improve reading, writing and speaking skills and/or make appropriate referrals.

g. promote better understandings and inter-relationships among individuals and groups, of different races, sexes, religious beliefs, national origins and socio-economic back-grounds.

h. make the students aware of the world of work, its opportunities, and to assist students in making the transition from the school to the community.

STANDARD IX The institution shall provide no later than the sophomore year, continuing field and clinical experiences appropriate to developing, assessing and presenting a sustained demonstration of role competencies including an experience which closely approximates full-time employment consistent with the area of certification.

Mathematics teachers may be assigned to junior and/or senior high school classes. They are also required to be knowledgeable of the mathematics curricula of the middle and elementary schools.

Effective mathematics teachers must be familiar with such items as:

a. the objectives and content of the many proposals for change in our curriculum and texts.
b. the techniques, relative merits and roles of such teaching procedures as the inductive and deductive approaches to new ideas.
c. the literature of mathematics and its teaching.
d. the underlying ideas of elementary mathematics and the manner in which they may provide a rational basis for teaching.
e. the chief applications which have given rise to various mathematical subjects. These applications will depend upon the level of mathematics to be taught, and are an essential part of the equipment of all mathematics teachers.

The following standards pertain to college programs for the preparation of mathematics teachers. The standards presented herein are concise statements of the more comprehensive statements in Guidelines for Preparation Programs of Teachers of Secondary School Science and Mathematics, National Association of State Directors of Teacher Education and Certification - American Association for the Advancement of Science.

STANDARD I — The program shall consider the sequential nature of mathematics and shall provide the prospective teacher an understanding of some of the aspects of mathematics which his pupils will meet in subsequent courses.

STANDARD II — The program of preparation shall include mathematical studies and experiences which are relevant to the secondary school curriculum, e.g., algebra, geometry, trigonometry, analytic geometry, calculus, probability and statistics.

STANDARD III — The program shall assure knowledge of curriculum improvement studies in mathematics currently being made by various national groups such as School Mathematics Study Group and University of Illinois Committee on School Mathematics.

STANDARD IV — The program shall provide knowledge of ways to apply the principles of mathematics to other disciplines (logis, science, psychology, economics, etc.).

STANDARD V	The program shall develop for the prospective teacher a historical understanding of the relationships of mathematics and the culture in which it existed, or exists.
STANDARD VI	The program shall provide laboratory experiences in working with pupils of both high and low academic abilities and develop the ability to teach computational as well as abstract mathematics.

APPENDIX IV: The Pennsylvania Comprehensive Mathematics Plan Direction for the 80's (PCMP)

The Pennsylvania Comprehensive Mathematics Plan Direction for the 80's (PCMP) is a model for developing a balanced mathematics curriculum consistent with the goals of the School Improvement Project. Supervisors who have not yet received a copy may obtain one from:

Dr. Doris Creswell
PDE
333 Market Street
Harrisburg, PA 17126

and incorporate it into this handbook.